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# The Arris and Gale Lectures

ON

# SOME PROBLEMS RELATING TO THE EVOLUTION OF THE BRAIN.

*Delivered at the Royal College of Surgeons of England on Dec. 13th, 15th, and 17th, 1909,*

BY G. ELLIOT SMITH, M.A. CAMB., M.D., CH.M. SYDNEY, F.R.S.,

PROFESSOR OF ANATOMY IN THE UNIVERSITY OF MANCHESTER.

## LECTURE II.[1]

*Delivered on Dec. 15th.*

MR. PRESIDENT AND GENTLEMEN,—In my first lecture I gave you a brief historical sketch of the discussions which established upon a firm basis the criteria which I shall make use of in the lecture to-day for the purpose of a critical analysis of the homologies of the various cortical areas found in the cerebral hemispheres of the lowlier vertebrata. This analytical study of the morphology of the cerebral cortex cannot be wholly divested of its highly technical and intricate character, because it deals with matters difficult in themselves, but which have been rendered infinitely more so by the various interpretations put upon the facts and the confusion of nomenclature with which these facts have been enshrouded by different writers. Nevertheless, this preliminary analysis is necessary before I can attempt a synthesis of the evidence relating to the evolution of the cerebral cortex in the vertebrata.

In my first lecture I explained to you how Professor Osborn, starting from the conclusions reached by Professor (afterwards Sir William) Flower in his researches on the cerebral commissures, proved that the upper of the two commissural bands found in the lamina terminalis of the monotreme (Fig. 6) and marsupial brain (Fig. 3) was the homologue of the topographically analogous commissure in the brains of reptiles, birds, amphibians, and even of certain fishes. It followed from this demonstration that, as soon as modern research had rehabilitated the conclusions reached by Professor (afterwards Sir Richard) Owen more than seventy years ago that this upper commissure in the marsupial was derived wholly from the hippocampi (Fig. 4), it became *a priori* probable that the area of the hemisphere wall from which the upper commissure sprang in the reptiles, birds, and amphibians would prove to be homologous with the hippocampus (compare Figs. 7, 8, 9, 10 and 11, *hip.*).

But these investigations yielded something more than mere *a priori* probabilities. We have seen that the cerebral cortex is fringed throughout the whole extent of its mesial edge in the monotreme and the marsupial by a properly developed and unmistakeable hippocampal formation. In all other mammals such a fringe is found only in that part of the mesial edge which extends from the uncus, near the tip of the temporal pole, to the posterior end of the corpus callosum (Fig. 1); but I have already called your attention to the fact that the rest of the mesial edge bears an insignificant rudiment, placed upon the corpus callosum (Fig. 1 *h''*) and in front of it (*h'''*) which morphological research has demonstrated to be the much atrophied vestiges of the anterior part of the hippocampal arc. Thus we find definite evidence for the generalisation that in *all* mammals the cerebral cortex is fringed with some structure representing a hippocampal formation along the whole extent of its mesial edge—from the olfactory peduncle in front to the region of the uncus behind and below.

For further elucidation of this matter see the figures illustrating Lecture I., also my writings,[2] and the beautifully illustrated memoirs of Giuseppe Levi, which confirm and extend my work on this subject.[3]

The recognition of the fact that the mesial edge of the cerebral cortex in all mammals is hippocampus points to the certainty that the corresponding part of the hemisphere in the ancestors of the mammalia must also be hippocampal in nature, and it also suggests the probability that this is a fundamental feature in the architecture of the cerebrum throughout the vertebrata. The failure to recognise this morphological argument led Professor Ramon y Cajal to reject the view that the mesial (medio-dorsal) part of the reptilian cerebral cortex is hippocampus,[4] and not only prevented him from reaping the full harvest of his own and his brother's important researches on the histology of the brain in reptiles and amphibians, but has also been responsible for the committal and the perpetuation of an error, which has found its way into most modern text-books of physiology and many books on anatomy—namely, the comparison of series of cortical nerve cells in different vertebrates in the belief that they formed a phylogenetic series. The whole value of such a comparison is destroyed when we realise that the cells were taken from areas which are *not* homologous.

But with the solitary exception of Ramon y Cajal all modern writers on this subject admit that the mesial fringing part of the cerebral cortex in all vertebrates must be hippocampus. Nevertheless some anatomists have failed to recognise exactly where the cortex ends and where the ganglionic mass, which the late Professor Huxley, in lectures delivered here in 1864[5] called "septal area," begins. It is a signal instance of Huxley's perspicuity that he came to realise the important morphological fact that the septum lucidum is merely the upper greatly stretched portion of the small and, in the human brain, quite insignificant band of ganglionic matter in front of the anterior commissure, to which Zuckerkandl many years afterwards gave the name "gyrus subcallosus." [In Fig. 1 (see Lecture I.) *p* is the gyrus subcallosus and *p'* is the septum lucidum. In Figs. 15–17, *para.* represents the paraterminal body.] Huxley grouped the septum lucidum and gyrus subcallosus together and called the whole "septal area." The septal area is the surface of the ganglionic mass to which I have given the name "paraterminal body"—"paraterminal" because in the lowlier vertebrates, in which its upper part is not yet modified to form the septum, its outstanding feature is its relationship to the lamina terminalis; and "body" to suggest its analogy to the striate body, not only structurally but also functionally. For the paraterminal body presents a relationship to the hippocampus analogous to that which the striate body has to the rest of the cortex (Fig. 17). It is one of the merits of Flower's work in 1867, to which I referred in my first lecture, that he accepted and demonstrated the importance of Huxley's conception of the "septal area," the full significance of which remained unappreciated until quite recently.

Just as the projection fibres of the neopallium (as well as many other tracts ascending to it) traverse the corpus striatum in the mammalian brain, so in all vertebrate classes the corpus paraterminale forms a matrix for fibres passing to and from the hippocampus; and part of the body in question often becomes prolonged as a fringe along the ventral edge of the reptilian and amphibian hippocampus, in a position analogous to that occupied by the fimbria in the mammalian brain (Fig. 15).

It is unfortunate that the late Professor von Kupffer should have mistaken this paraterminal fringe in the reptilian brain for the hippocampus itself—unfortunate, not only because von Kupffer admitted the logic of the morphological argument I have been discussing in this lecture; but especially from the fact that the element of confusion which he has

[1] Lecture I. was published in THE LANCET of Jan. 1st, 1910, p. 1. For most of the illustrations (Figs. 6 to 15) in this report I am indebted to the Council of the Linnean Society.

[2] A Preliminary Communication upon the Cerebral Commissures of the Mammalia, with special reference to the Monotremata and Marsupialia, Proceedings of the Linnean Society of New South Wales, vol. ix. (series ii.), pp. 635–657, October, 1894. The Origin of the Corpus Callosum: a Comparative Study of the Hippocampal Region of the Cerebrum of Marsupialia and Certain Cheiroptera, Transactions of the Linnean Society of London, second series, Zoology, vol. vii., Part 3, pp. 47–69, June, 1897 The Morphology of the Indusium and Striae Lancisii, Anatomischer Anzeiger, Band xiii., Nos. 1 and 2, 1897. The Relation of the Fornix to the Margin of the Cerebral Cortex, Journal of Anatomy and Physiology, vol. xxxii., pp. 23–58 (read before the Anatomical Society of Great Britain and Ireland at Dublin, June, 1897). Further Observations upon the Fornix, with Special Reference to the Brain of Nyctophilus, Journal of Anatomy and Physiology, vol. xxxii., pp. 231–246, January, 1898.

[3] Morfologia e Minuta Struttura dell'Ippocampo Dorsale, and Sull'Origine Filogenetica della Formazione Ammonica, Archivio di Anatomia e di Embriologia, 1904.

[4] Studien über die Hirnrinde des Menschen, 1906, Heft 5—Bresler's translation into German. (Compare my Fig. 16, H.)

[5] Medical Times and Gazette, March 5th, 1864, p. 256.

thus unintentionally introduced is rendered far-reaching by being embodied in his excellent contribution to that great book of reference, Hertwig's "Handbuch der Vergleichenden und Experimentellen Entwickelungslehre der Wirbelthiere."[6]

I have mentioned these matters, not so much for the reason of putting aside once for all the teaching of Ramon y Cajal and von Kupffer in reference to these points in the morphology of the cerebral cortex, as to bring before you the third element of proof that the medio-dorsal cortex of the sauropsida and the ichthyopsida is really hippocampus.

We have now seen, firstly, that the homology of the upper cerebral commissure in amphibians, reptiles, birds, monotremes, and marsupials having been established, the fact that this commissure springs from the hippocampus in the latter two groups of animals suggests the view that in the first three groups the area from which it arises is also hippocampus. Secondly, this view is further supported by the consideration, which I have just been setting forth, that the mesial fringe of the cerebral cortex must be hippocampus. To these arguments I must add the third and conclusive element in the evidence—that if the structure of the hippocampal rudiment in the fœtal monotreme, the arrangement of its fornix-fibres, its relationship to the paraterminal body, and the structure of the latter be compared with the conditions found in the reptile there can be no room for doubting the identity of the hippocampus in the latter.

A comparison of Figs. 8 and 9, representing transverse sections across the cerebral hemispheres (and their commissures) in a fœtal monotreme and a reptile respectively, will make this argument clear. The crucial regions in these two sections are shown upon an enlarged scale in Figs. 13 and 14.

I have set out this evidence in great detail elsewhere and given a series of diagrams to indicate how convincing and final the argument is.[7] We can take it, then, as an established and incontrovertible fact that the cortical area which immediately adjoins the ganglionic mass of the paraterminal body is hippocampus, whether it be the brain of a mammal, a reptile, a bird, or an amphibian that we happen to be examining.

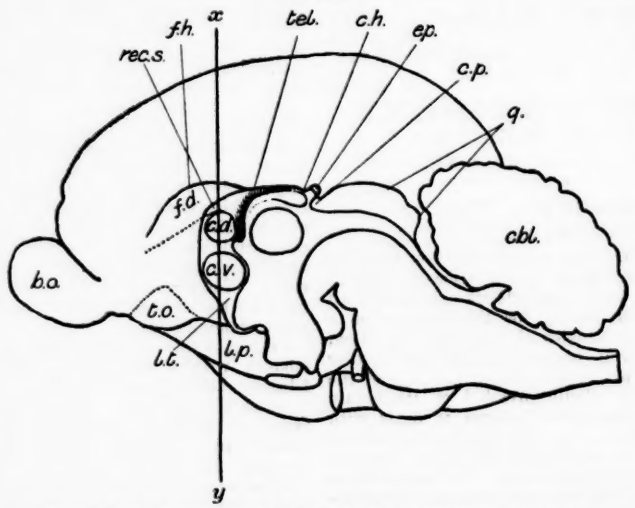
But even when we have attained a general consensus of opinion that the medio-dorsal cortex of the reptilian brain is hippocampus, there still remain for solution two fundamental problems in the interpretation of this cortical area: (1) How much of the cortex represents the hippocampal formation; and (2) what is its nature — i.e., is it specialised into fascia dentata and hippocampus *sensu stricto*? The attempts at answering these two queries have yielded many conflicting interpretations, which are a source of the greatest confusion in the current literature of cerebral morphology.

With reference to the first query, How much of the reptilian cortex is hippocampus? — there can now be no doubt as to its mesial limitations. This has been made clear in the foregoing remarks. But where it ceases on the dorsum of the hemisphere is still a matter of dispute.

In many reptilian brains three distinct parts of the pallium, which forms the roof of the hemisphere (Fig. 16), are recognisable: the mesial (medio-dorsal) cortex (H), the dorsal cortex (D), and the lateral cortex (L).

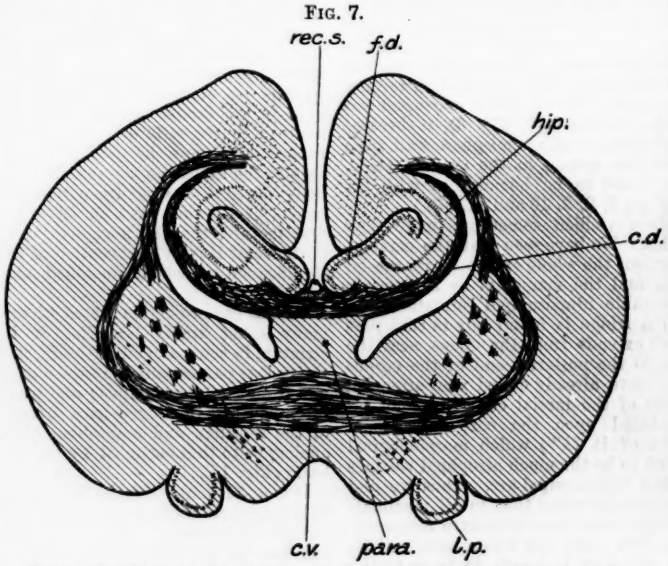
Fourteen years ago, as the result of a detailed comparison of fœtal monotreme and reptilian brains, I was led to adopt the view adumbrated in 1892 by Dr. Adolf Meyer[8] that the mesial cortex alone represents the whole hippocampal formation. Within recent years Dr. Giuseppe Levi[9] has come to the support of Meyer and me in maintaining this opinion. But Professor Edinger[10] and Dr. Ariëns-Kappers have lent the weight of their great authority to another interpretation, in accordance with which the medio-dorsal cortex (H) represents the fascia dentata only, while the dorsal cortex (D) is the hippocampus *sensu stricto*. Ramon y Cajal, who, as I have already mentioned, opposed the view suggested by

FIG. 6.




The outlines of the mesial aspect of the brain of Ornithorhynchus, shown in Fig. 5 (THE LANCET, Jan. 1st, p. 5). The line *x*, *y* indicates the plane in which the section represented in Fig. 7 was cut.

FIG. 7.




Transverse section of brain of platypus, cut in the plane *x*, *y* (Fig. 6). *c. d.*, Hippocampal commissure. *hip.*, Hippocampus. *f. d.*, Fascia dentata. *para.*, Paraterminal body. *rec. s.*, superior recess of third ventricle.

[6] Band ii., Teil 3, 1906.

[7] On the Morphology of the Cerebral Commissures in the Vertebrata, with Special Reference to an Aberrant Commissure in the Brain of certain Reptiles. Transactions of the Linnean Society of London, second series, Zoology, vol. viii., part xii. By the courtesy of the Council of the Linnean Society I am able to reproduce some of these diagrams here.

[8] Zeitschrift für Wissenschaftliche Zoologie, Band lv.

[9] Op. cit., supra.

[10] Vorlesungen, 1908.

Meyer and me that the mesial cortex (H) was hippocampal, has brought forward fatal objections to the interpretation suggested by Edinger and Ariëns-Kappers by demonstrating that the mesial cortex cannot be regarded simply as fascia dentata.

However, the histological facts, which have been so clearly elucidated by Ramon y Cajal, do not clash with the interpretation of the mesial cortex as a hippocampal formation; on the other hand, they help to explain much that was obscure, and they have enabled me to complete the chain of evidence concerning the nature and the mode of specialisation of that formation into fascia dentata and hippocampus *sensu stricto*.

[With the help of a large series of diagrams the lecturer then explained the objections to Edinger's and Ariëns-Kappers's interpretation and the definite and precise reasons for regarding the medio-dorsal cortical area alone as hippocampal formation.]

In many reptiles the hippocampal cortex differs in texture at its mesial (ventral, Fig. 16, *a*) and lateral (dorsal, Fig. 16, *b*) extremities; at various times Meyer (1892), I (1896), and Levi (1904) have suggested that the development of more numerous and smaller cells at the mesial end (*a*) was a phase in the evolution of the fascia dentata. An examination of the minute structure of this mesial small-celled part justifies the statement made by Ramon y Cajal that it would not be correct to call it "fascia dentata," yet it is quite certain that it represents a stage which is already far advanced on the way to the differentiation of a true fascia dentata (see Fig. 17).

The column of cells in the mesial cortex (H) of the reptile contains cells closely resembling and almost as highly specialised as those of the mammalian fascia dentata, but intermingled with cells of a form like those found in the hippocampus (*sensu stricto*) of the mammal as well as a third category of cell intermediate between the other two in structure and in the nature of its fibre connexions. At the mesial end of the column (*a*) the first class of cell is more abundant; at the lateral end (*b*) the other types. In mammals the second and third categories of cells disappear entirely from the main column of cells at its mesial end and thus the rudiment of the fascia dentata is formed. Some of the other two categories of cells remain on the ventricular side of the column and form the so-called nucleus fasciæ dentatæ. In the lateral part of the column the dentate type of cell disappears and we have the hippocampus *sensu stricto* as the result. Thus, in the mammal the hippocampal formation becomes specialised to form its two characteristic parts—the fascia dentata, which is a receptive mechanism for impressions of smell, and the hippocampus proper, which receives afferent impulses mainly through the intermediation of the fascia dentata and gives off projection fibres to other parts of the nervous system. If we call the fascia dentata olfacto-sensory the rest of the hippocampal formation might, perhaps, be termed olfacto-psychic, on the analogy of the terminology applied to the visual cortex in the neopallium.

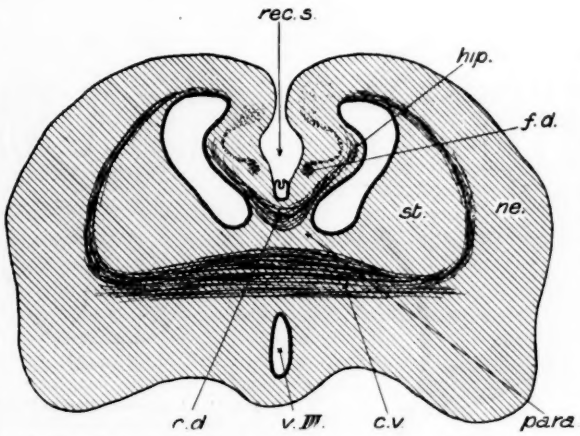
Having established the homology of the medio-dorsal cortex in the reptilian brain let us now briefly consider the significance of the dorsal (D) and the lateral cortex (L). Edinger and Kappers regard the dorsal cortex (D) as being the representative of the hippocampus *sensu stricto* (i.e., that part of the hippocampal formation which is not fascia dentata and forms in the mammalian brain the hippocampal bulging into the lateral ventricle); and the former writer looks upon the lateral cortex (L) as the homologue of the neopallium.

There seems to me to be sufficient evidence that the lateral cortex (L) receives the terminations of the nerve fibres of the lateral olfactory tract, and that for this reason, as well as on general morphological grounds, it is to be regarded as the homologue of the lobus pyriformis of the mammalian brain.

If we study the anatomy of the brain in the lowliest mammals it will be found that the neopallium becomes reduced to very small proportions in such marsupials as the "bandicoot" (*Perameles*) and the "marsupial mole" (*Notoryctes*), and presumably in these animals we approach as nearly as possible to the condition found in reptiles. In these brains the narrow area separating the mesial cortex (hippocampal formation) from the lateral cortex (pyriform lobe) is composed of neopallium; and by analogy I had imagined hitherto that the dorsal cortex of the reptile (D) must be the earliest representative of the neopallium. But there are many objections to the adoption of this view, which, on further study, have become so overwhelming that I feel compelled to reject the hypothesis of the neopallial nature of the dorsal cortex.

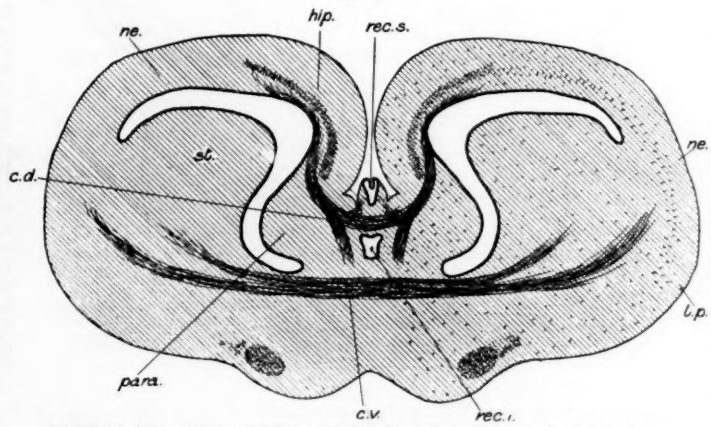
In the mammalian brain there is a strip of cortex immediately on the peripheral side of the hippocampus, which is commonly called the "subiculum hippocampi"; when the hippocampal formation extends upwards to the splenium of the corpus callosum and passes into the insignificant vestigeal band upon the corpus callosum, the subiculum does not end there, but is continued forward at the lower part of the gyrus cinguli. This is the cortical area from which Koelliker, Zuckerkandl, Oskar Vogt, and

FIG. 8.




A corresponding section through a fœtal monotreme brain (Echidna). Same lettering as in Fig. 7. Note that the rudimentary fascia dentata has come into line with the hippocampal column of cells.

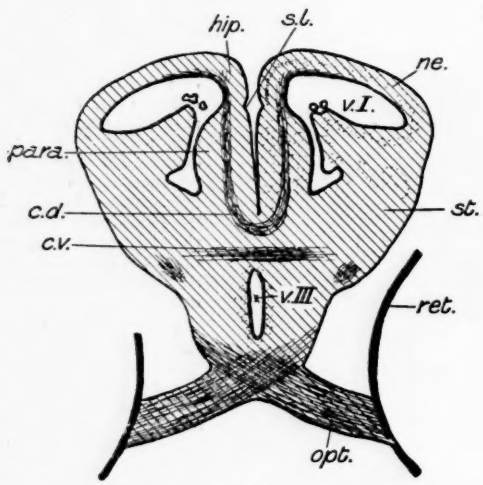
FIG. 9.




A corresponding section through a reptile's brain (*Hydrosaurus*). Same lettering as in Figs. 7 and 8.

Ramon y Cajal, amongst others, have shown fibres of the fornix longus to arise. As Ariëns-Kappers has well said, this area does not properly form part of the neopallium: it is really a transition region between it and the hippocampus. I have come to the conclusion that it is a closer approximation to the truth to regard the dorsal cortex of the reptilian hemisphere (D) as comparable to that part of the gyrus cinguli (the "interhemispheric cortex" of Ramon y Cajal), which is related to the fornix system.

FIG. 10.




A corresponding section through the brain of a fœtal Tuatara (*Hatteria*)—for comparison with Fig. 15, to explain how the paraterminal body (*para*) gets into the position shown there.

FIG. 11.

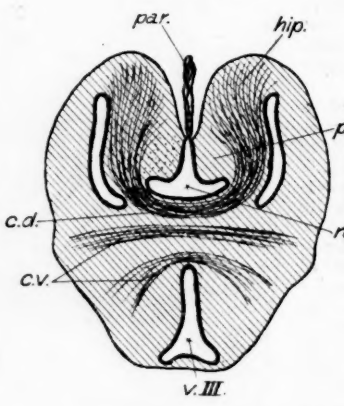



FIG. 12.

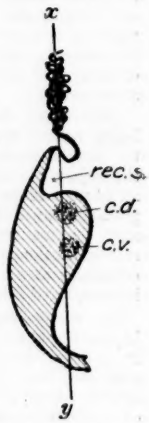


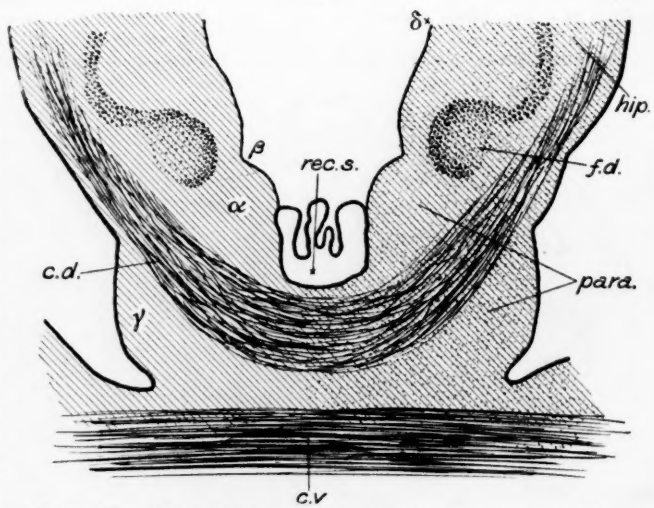

FIG. 11.—A corresponding section of a frog's brain to show its conformity to the same general scheme exhibited in Figs. 7, 8, 9, and 10.

FIG. 12.—The frog's lamina terminalis (compare Figs. 6 and 14) to show the plane in which the section shown in Fig. 11 was cut, and to demonstrate that the recessus superior (*rec. s.*) is identical in mammals, reptiles, and amphibians—i.e., the essential relations of the hippocampal commissure to the ventricle are identical, a fact denied by Johnston and other writers.

It will be observed that we are returning once more to a conception such as the genius of Broca embodied in the idea of a limbic lobe, which found more exact expression under the name "falciform lobe," as it was later modified and defined by Schwalbe.

[With the help of a series of diagrams the lecturer explained the reasons for the adoption of this view, and demonstrated the two-fold arrangement of olfactory paths to the reptilian hippocampus—into its mesial fringe by fibres (Fig. 16, *f*) springing from the base of the hemisphere and others (*p*) coming from the lateral direction from the pyriform lobe, *viâ* the dorsal cortex.]

FIG. 13.




The crucial region from Fig. 8 shown on an enlarged scale to show the precise relations of the paraterminal body (*para.*), recessus superior (*rec. s.*), and fascia dentata (*f.d.*).

We are now in a position to outline the chief phases in the evolution of the cerebral cortex.

Beginning at the root of the vertebrate phylum we find that the lamprey (*Petromyzon*) has a cerebral hemisphere no bigger than its olfactory bulb. Into almost every part of the surface of this hemisphere nerve-fibres pass directly from the olfactory bulb. According to the recent researches of Dr. Tretjakoff of St. Petersburg, the whole surface of the hemisphere in the larval lamprey (*Ammocœtes*) receives such fibres, but in the adult there is, I believe, a definite primordial cortex to which smell impressions pass indirectly through the intermediation of another part of the hemisphere.

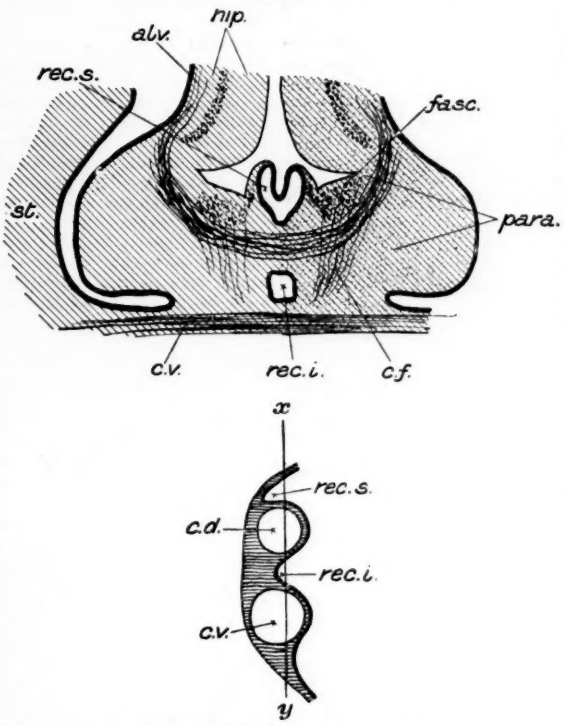
Even in this primitive brain there is already some slight indication of a differentiation of structure in the hemisphere. The greater part of the surface represents the rudiment of that basal cortex-like structure found higher in the vertebrate scale, which is called tuberculum olfactorium. Lying deeper, around the ventro-lateral aspect of the lateral ventricle, is the primordial corpus striatum, the part of the hemisphere which is brought into relationship on the one hand, with afferent fibres from the tuberculum olfactorium, and perhaps with others coming up from the hypothalamus, and, on the other hand, emits projection fibres passing both to the hypothalamus (and lobus inferior) and to the thalamus (ganglion habenulæ). There is a third part representing a primordial pallium lying at the dorso-mesial aspect of the hemisphere, where the latter is joined to the epithelial roof of the fore-brain.

In its most primitive form the brain of the vertebrate animal might be compared to a close confederation of States, none of which is absolutely dominant. The cerebral hemisphere is little more than an instrument for the reception and conscious appreciation of smell impressions and a means whereby such impressions may bring their influence to bear on the nervous mechanisms which regulate movements, and so contribute their quota to the forces which control the behaviour of the animal and its reactions to its environment.

The mid-brain is related in an analogous manner to the

visual organs, and in the lowliest vertebrates probably exercises a more potent influence than the cerebrum. But even in *Petromyzon* there are numerous connecting links between these different sensoria, which enable the impressions coming from one organ to influence the activities of the receptive apparatus of another sensory mechanism. The higher organisation of the brain is brought about by the extension of all the sensory paths up to the cerebrum and the evolution within the hemisphere of mechanisms for receiving and blending the various impressions of an object, so as to awaken a consciousness of all its properties, as they appeal to the senses of smell, taste, touch, sight, hearing, &c. But the cerebral hemisphere does far more than this—it provides a site far removed from the merely executive parts of the nervous system where these various sensory impressions, or the states of consciousness which they awaken, may be in some way recorded, so that later on new impressions may be influenced, compared, and tested by the results of these foregoing experiences. In other words, the cerebrum attains its dominant position in the hierarchy of the brain mainly because it provides the means for the evolution of an organ of associative memory.

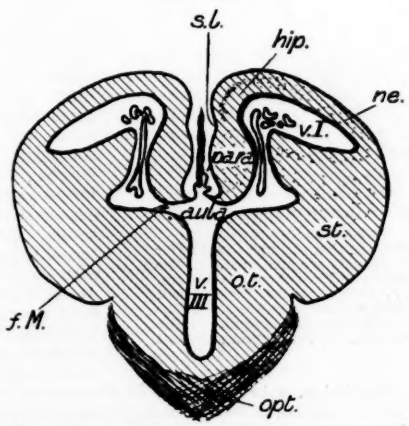
FIG. 14.




The corresponding part of Fig. 9, similarly enlarged to show its identity with the mammalian plan (*fasc.* here is *not* fascia dentata, but a particular fasciculus of the fornix in the paraterminal body).

But it took long ages of experiment before Nature slowly evolved from the primitive *Petromyzon* type of brain this organ of associative memory, which is found in its fully developed form only in mammals.

FIG. 15.

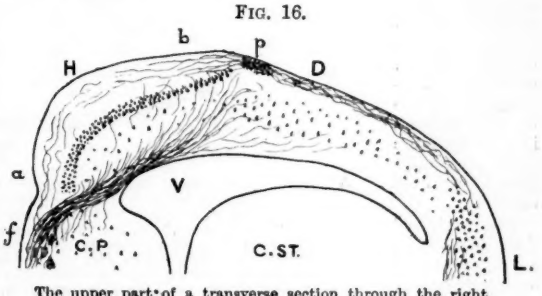



A section cut transversely through the fœtal Tuatara brain in the region of the foramen of Monro (*f. M.*) to show the paraterminal appendage (*para.*) of the hippocampus (*hip.*) which was mistaken for the latter by von Kupffer.

In sketching the present state of our knowledge concerning the origin of this highest type of cerebral hemisphere it is convenient to restrict our studies mainly to the consideration of four selected types: (1) a particular selachian; (2) a dipnoan; (3) a reptile; and thence pass to the lowlier mammals. Without a much larger allowance of time than I have at my disposal, it would simply be adding to the difficulties of the subject to refer to the specialised forms of brain found in most fishes and amphibians. The mud-fishes (dipnoi) are much nearer the main line of amniote evolution than the amphibia and most other fishes, and so far as the special object of these lectures is concerned, i.e., the evolution of the cortex cerebri, the dipnoi exhibit a more highly developed—at any rate, a much more reptilian-like—pallium than we find in any of the amphibia. Birds again present such a highly specialised and diversely-modified cerebrum that they have quite left the path leading to the formation of a neopallium and evolved a mechanism peculiar to their own class, which does much the same kind of work as the neopallium.

If, after examining the cerebral hemisphere in the lamprey, we turn to the elasmobranch fishes a much more definite specialisation into the three parts mentioned in the case of *Petromyzon* will be found. The fish which lends itself best to our purpose is one described by Professor Edinger and Dr. Ariëns-Kappers under the name *Spinax niger*.[11] In a transverse section through the hemisphere of this brain there will be seen upon the dorsal aspect a definite cortex cerebri or pallium forming almost a third of the section. Upon the ventral aspect there is another cortex-like structure—the tuberculum olfactorium—forming almost half of the section; separating this from the cavity of the lateral ventricle there is a thin layer of grey matter representing the primordial corpus striatum.

FIG. 16.




The upper part of a transverse section through the right hemisphere of a reptilian brain. H, The medio-dorsal cortex or hippocampus. D, The dorsal cortex. *f*, Fornix. C.P., Corpus paraterminale. C.ST., Corpus striatum. V, Lateral ventricle.

Thus by an easy step we have passed from the most primitive type of vertebrate brain to one in which a true and definite cerebral cortex or pallium is present. It is an even simpler matter to pass from the condition found in this selachian hemisphere and institute an exact comparison with that of the South American mud-fish *Lepidosiren*.[12]

[11] See Edinger, Bau der Nervösen Zentralorgane, Band ii, 1908, fig. 265, p. 299.

[12] I have described this in some detail in the Anatomischer Anzeiger, Band xxxiii., 1908, pp. 513-540.

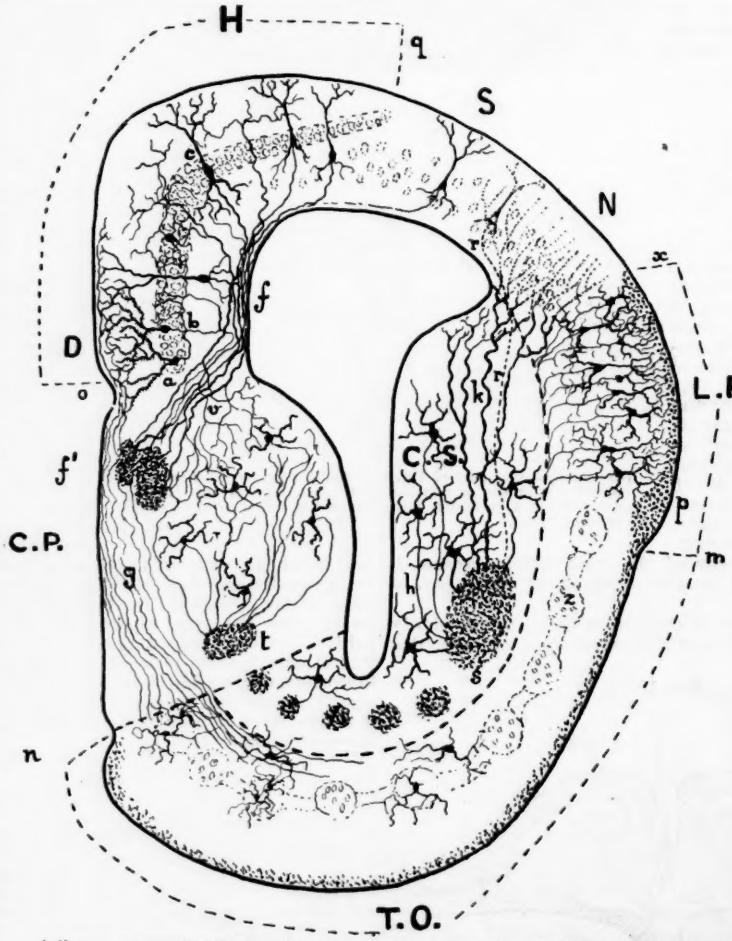
The general scheme of the constitution of the hemisphere in *Lepidosiren* closely resembles that of *Spinax*, but the specialisation of the different parts has been carried to a much higher stage. The pallial formation contains a more compact and regular layer of cortical cells; its lateral extremity shows signs of commencing specialisation to form the rudimentary pyriform lobe (compare Fig. 16, L), into which the fibres of a definite lateral olfactory tract penetrate; and the mesial extremity of the pallial formation is a definite primordium hippocampi (compare Fig. 16, H) with a well-developed system of fornix fibres in relation with it (compare Fig. 16, *f*). The hippocampus and the paraterminal body (compare Fig. 16, C P), which is functionally associated with it, are intimately connected with the lobus inferior (of the hypothalamic region) both by descending and ascending fibres; and it is possible that some of the latter may carry gustatory impulses into the cerebral hemisphere from the lobus inferior, into which (in the case of teleostean fishes) Professor Judson Herrick has traced large tracts carrying impulses upward from the taste nerves inserted into the medulla oblongata.

In *Lepidosiren* the tuberculum olfactorium becomes so large that it forms more than half the hemisphere, and its cortex is most richly developed. It receives smell impulses direct from the olfactory bulb, and probably exerts an immediate influence upon the corpus striatum, which is so intimately related to it, and through it acts upon the more caudally-placed parts of the brain.

The brain of *Lepidosiren* is sufficiently highly organised to permit us to take the great step upward from the mud fishes to the reptiles without running any risk of sacrificing accuracy in our comparisons.

Compared with the condition of the hemisphere in the mud-fish that of the reptile presents three outstanding features of contrast. The pallial formation has undergone a great increase in size and an even more noteworthy specialisation in structure; the corpus striatum has become very much larger; and the tuberculum olfactorium has become smaller, its cortex especially being much less richly developed than that of *Lepidosiren*.

FIG. 17.




A diagram representing the essential features which a coronal section through the anterior end of the right hemisphere of a hypothetical promammal must have presented. H, The hippocampus. D, Its mesial part in process of specialisation to form the fascia dentata. *a*, Its "dentate cells." *c*, Its "hippocampal cells." *b*, An intermediate type of cell. *f*, *f'*, Fornix. C.P., The corpus paraterminale. T.O., Tuberculum olfactorium. S, The dorsal cortex (compare D in Fig. 16), now become the subiculum hippocampi. L, The lateral cortex of the reptile, now become the lobus pyriformis. N, The earliest rudiment of the neopallium. C.S., The corpus striatum.

The higher degree of specialisation of the cortex is largely the result of a perfecting of the smell-mechanism; both the mesial and the lateral parts of the pallium (Fig. 16, H and L) become specialised and set apart from the intermediate (dorsal) cortex (D), and the hippocampal formation itself (H) shows signs of commencing specialisation to form the fascia dentata (*a*) and hippocampus *sensu stricto* (*b*). The fornix system (*f*) has become more highly developed and the paraterminal body (C P) has increased in bulk. In mammals it is a well-known fact that when an animal takes to living in water its olfactory apparatus dwindles until, in some of them which lead a wholly aquatic life (for example, certain whales and porpoises), the smell-organs vanish completely. In the lowlier vertebrates, however, the olfactory organs seem to be able to perform their functions in water; nevertheless, even in such animals they would probably become capable of a wider sphere of usefulness if the animal were to leave the water and take to dry land. Thus it is that in the reptiles, the lowliest class of vertebrates adapted for leading a wholly terrestrial existence, the sense of smell takes on an enhanced importance and the olfactory part of the brain—the cerebral hemisphere—shows a marked advance in size and degree of specialisation.

In the reptilian brain the mass of fibres connecting the corpus striatum to the thalamic and other regions of the brain shows a noteworthy increase in bulk. Amongst these fibres, which form a projection system analogous to that of the internal capsule in mammals, there are also present large numbers of ascending fibres, which are coming up from the region of the thalamus to terminate in the cerebral hemisphere. These fibres are of the utmost importance in the study of the history of the developing cortex. Our knowledge of them is as yet very imperfect and wholly inadequate for our purposes; yet, scanty as it is, its significance is very great. The histological researches of Ramon y Cajal have familiarised us with the endings of this system of fibres; but most of our knowledge of the nature of these tracts has been supplied by the important comparative and experimental researches of Edinger, Wallenberg, Gordon Holmes, and Ariëns-Kappers.

It is well known that birds possess very large and highly developed cerebral hemispheres, in spite of the fact that in

many of them the sense of smell is of little consequence and the olfactory apparatus is very much reduced in size. It is obvious that the greatness of the hemisphere must be due to the admission into it of the paths coming from some other sense organs. Visual impulses certainly make their way into the bird's cerebrum; and Edinger, Wallenberg, and Holmes have demonstrated the presence of large tracts carrying to the hemisphere impulses collected by the trigeminal nerve, probably from the beak, the tongue, and other oral tactile areas.

In reptiles, which Huxley long ago showed to be nearly allied to birds, the thalamic nucleus in which the trigeminal lemniscus terminates is also largely developed; tracts pass from it into the corpus striatum; it is thus practically certain that a considerable proportion of the fibres which may be seen in the corpus striatum of any reptile, streaming up towards its dorsal surface, are the paths by means of which sensory impressions are being poured into the hemisphere.

It is well known that many reptiles use their tongues as tactile organs and test their food by associating impressions of smell and touch. It is also more probable than not that visual impressions can make their way into the reptile's hemisphere, but as yet the evidence is not altogether conclusive; and of the auditory paths even less is known.

It is probable that the enhanced importance of the sense of smell in reptiles, which followed upon their adoption of terrestrial habits, added to the functional value of the cerebral hemisphere, which had hitherto been an essentially olfactory organ; into relationship with these structures, which are concerned with the consciousness of smell and taste, it was natural that there should be brought the fibre-tracts conveying impressions from the tactile organs of the mouth, which stand in such intimate functional relationship with those senses. Thus the hemisphere in the reptile became a place of blending of the consciousness of the smell, taste, touch, and perhaps sight also, of objects which stimulated the organs of these various senses.

The admission of these new sensory paths into the hemisphere produced very marked effects, which are of very great significance, though they must be regarded merely as premonitory signs of the much vaster and far-reaching effects of the extension of the same process which characterise the birth of the mammalia and the evolution of that essentially mammalian organ—the neopallium.

The sensory fibres newly admitted to the hemisphere make their way to the dorsal aspect of the corpus striatum, and, as the immediate effect, the cortex in the neighbourhood takes on a sudden and rapid growth. This leads to great confusion in the structure of the hemisphere at the pallio-striate junction, the exact details of which have not yet been properly elucidated. There is, however, no structure to which the designation "neopallium" can be properly applied, even though we recognise that the disturbance produced is a sign of the first stage of the labour attending the birth of the new pallium.

One curious manifestation of these disturbing influences is seen in the ingrowth (towards the lateral ventricle) of part of the overgrown pallium, forming a structure, to which Edinger gave the name "epistriatum."[13] The epistriatum is not part of the striate body but is cortical in nature. Moreover, it is not a morphological subdivision of the hemisphere which can be identified in other groups of vertebrates, as many anatomists believe; it is merely a peculiar adaptation of structure to meet the conditions special to the reptile—namely, the disturbing influence of the recent admission of tactile impressions to the hemisphere.

Very great confusion has been introduced into the literature of brain anatomy through the failure to recognise that the conditions which have called this epistriatum into being are peculiar to reptiles, and that it is futile to search for any exact homologue of that body in other vertebrates. "Epistriatum" is a term which can be employed without confusion only in reference to the reptilian brain.

I have now sketched the main phases of the progressive development of the cerebral cortex in the vertebrate series until we have seen the premonitory signs of the crowning achievement of the process—the appearance of the ultimate product of the evolution of the animal fabric, the neopallium, which is the "organ of mind."

For the purpose of focussing the light which the study of the lowlier vertebrate types of brain has shed upon the nature of the mammalian cortex I have constructed a diagram (Fig. 17) to represent the essential features which the cerebral hemisphere of the reptilian-like ancestor of the mammalia must have exhibited. No living reptile is in the direct line of mammalian descent, so that the detailed comparison of the brain of any one reptile with that of a mammal is liable to lead to error. But if we take those features common to all reptilian brains and make a diagram representing a phase intermediate between that common denominator and the state of affairs found in the most generalised marsupials we arrive at what we may truly call the "promammalian" type of hemisphere represented in Fig. 17. It exhibits the essential relations of the two fundamentally distinct cortical areas—the basal or tuberculum olfactorium (T. O.) and the true cortex or pallium (D, H, S, L). The latter is differentiated into hippocampus (H), subiculum hippocampi (S), and lobus pyriformis (L); and between the latter two the newly differentiated "neopallium" (N) is seen in its earliest phase. The paraterminal body (C. P.) is the ganglion of the hippocampal cortex and is related to its fibre-systems (*f*, *f'*, *g*, and *t*) in a manner closely analogous to that of the corpus striatum (C. S.) to the fibre-systems of the neopallium and pyriform lobe (*k*, *r*, *h*, and *s*).

[13] For the most primitive form of epistriatum see the illustrated and descriptive catalogue of this museum, vol. ii., 1902, Figs. 32 and 33, pp. 122 and 123.

# A Clinical Lecture

ON

# CONGENITAL FAMILY CHOLÆMIA, OR RECURRENT FAMILIAL JAUNDICE.

*Delivered on Dec. 2nd, 1909,*

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LADIES AND GENTLEMEN,—One of the most interesting and least common of all diseases occurring in childhood has been termed congenital family cholæmia, or familial recurrent periodic jaundice. It is a condition not peculiar to childhood, for these patients may live to grow up and may marry and have families, some members of which may in turn show the same disability.

The great interest of this disease or fault does not lie so much in its rarity or in its hereditary characteristics as in the possible light that it may throw upon diseases of the spleen in their relation to the blood and liver. At the present time we are accumulating a vast number of facts about diseases of the spleen and the blood changes connected with them, and we recognise that in some of these conditions the liver is grossly affected, in others it is not, but the solution of the problem still remains a great mystery. This rare disease seems likely to throw some light upon the subject if we can only collect a sufficient number of cases for observation. Even those I am about to describe will illustrate some points of special interest in this study, and they show some peculiarities which may have been observed before but which have not, I think, been put forward. It is, indeed, almost impossible not to observe some interesting fact if you have a family of this kind under your care for any length of time. The cardinal features of my cases can be described in a few sentences. 1. They have all had jaundice immediately after birth. 2. They have had more than one attack. 3. They all have enlarged spleens and during their attacks enlarged livers also. 4. They are all anæmic and show definite changes in the blood. 5. Lastly, they are all somewhat undersized and delicate.

These three cases were shown at a clinical meeting of the Medical Society of London by Dr. W. L. Scott and myself in the spring and belong to the same family, and we are greatly indebted to Dr. Sidney Martin and Dr. Risien Russell for permission to use some of the notes made while under their care. The history of this family, so far as we could ascertain, is as follows. Their paternal grandmother had several attacks of jaundice and their mother suffers from biliousness. The family itself was 13 in number but 5 are dead. Two died from "consumption," one from "pneumonia," and two died in the first week of life from unknown causes. In accord with all the most characteristic cases on record there

is no history of congenital syphilis. The children that are affected are the fifth, a young woman aged about 23 years; the twelfth, a boy aged about 9 years; and the thirteenth, a girl aged 5½ years. The ninth child, a boy of about 13, I examined and found to be unaffected. I will now give a few details of each case.

CASE 1.—This patient is 23 years of age and she is the eldest of the three whose cases are here recorded. She has had six attacks of jaundice and I have seen one of the worst of them in which the jaundice was intense. Her first attack occurred 14 days after birth, and in 1903 and 1905 there were severe ones. In 1908 there was a mild attack. The chief features of the one which came under my personal observation in 1905 were as follows. 1. A gradual onset with a sudden exacerbation during which there was the development of an intense yellow colour. 2. Paroxysms of abdominal pain, which were more severe at night, and chiefly referred to the splenic area. 3. Considerable enlargement of the liver which extended two fingers' breadth below the costal arch. I want particularly to draw attention to this point because in my experience of this family the liver has enlarged very markedly during attacks of jaundice, the spleen during attacks of anæmia. 4. Marked enlargement of the spleen which extended two fingers' breadth below the left costal margin. 5. Clay-coloured motions. 6. Bile and urobilin in the urine. 7. Absence of pyrexia. In three weeks' time there was recovery and the liver was no longer palpable. At this date the history of the other patients was unknown, and the condition was not recognised. This was also true when she was again admitted to the hospital not for jaundice but for anæmia.

The second admission was in October, 1906. There was then marked anæmia as shown by the blood counts, and with this functional cardiac murmurs, enlarged lymphatic glands in the posterior triangles, and an enlarged spleen. The liver was not palpable and no bile nor urobilin was found in the urine. The patient improved after two months' treatment with arsenic. Since that date she has come to me for paroxysmal abdominal pain, which has gradually passed away, and I then lost sight of her for a period of two years, that is, until shortly after Christmas, 1908, when she had an attack of jaundice lasting three days, which coincided with a severe cold. She now again came to me for increasing anæmia and breathlessness. At this date I once more found the liver enlarged and the spleen bigger than it had been before, but under treatment the liver once more almost regained the normal size. At the present time she is keeping in fair health.

*Blood counts.*—Oct. 16th, 1906: Red blood corpuscles, 3,000,000 per cubic millimetre; hæmoglobin, 78 per cent.; colour index, 1·1; shape, size, &c., normal; white blood corpuscles, 30,000 per cubic millimetre. Differential count, per cent.: small lymphocytes, 20; large lymphocytes, 6; hyaline, 1; neutrophiles, 68; eosinophiles, 3; transitional, 2. Treatment: Oct. 19th, 21st, 24th, 28th, and 31st, 1, 2, 3, 5, and 6 minims respectively of liquor arsenicalis three times a day; Nov. 1st, omitted.

Nov. 2nd: Red blood corpuscles, 3,500,000 per cubic millimetre; hæmoglobin, 75 per cent.; colour index, 0·95; vacuolation, poikilocytosis, and some anisocytosis; white blood corpuscles, 35,000 per cubic millimetre. Differential count, per cent.: small lymphocytes, 26; large lymphocytes, 20; hyaline, 2; neutrophiles, 50; transitional, 2.

9th: Red blood corpuscles, 3,672,000 per cubic millimetre; hæmoglobin, 56 per cent.; colour index, 0·7; vacuolation, poikilocytosis, some anisocytosis, and a few normoblasts; white blood corpuscles, 13,576 per cubic millimetre. Differential count, per cent.: small lymphocytes, 28·9; large lymphocytes, 10·2; neutrophiles, 53·3; transitional, 4; oxyphiles, 3·5. Treatment: Nov. 10th, 12th, 15th, and 19th, 2, 3, 4, and 5 minims respectively of liquor arsenicalis three times a day; Nov. 21st, omitted.

16th: Red blood corpuscles, 2,982,000 per cubic millimetre; hæmoglobin, 64 per cent.; colour index, 0·97; shape, size, &c., same as on preceding day; white blood corpuscles, 13,575 per cubic millimetre. Differential count, per cent.: small lymphocytes, 12·6; large lymphocytes, 42·3; neutrophiles, 36; transitional, 3·6; eosinophiles, 4·5.

23rd: Red blood corpuscles, 3,160,000 per cubic millimetre; hæmoglobin, 66 per cent.; colour index, 0·9; shape, size, &c., same as on preceding day; white blood corpuscles, 19,000 per cubic millimetre. Differential count, per cent.: small lymphocytes, 20·9; large lymphocytes, 34·4; neutrophiles, 40·5; hyaline, 2·1; oxyphiles, 2·5. Treatment: Nov. 28th and Dec. 1st and 4th, 2, 3, and 4 minims respectively of liquor arsenicalis three times a day: 9th, omitted.

30th: Red blood corpuscles, 3,672,000 per cubic millimetre; hæmoglobin, 60 per cent.; colour index, 0·8; shape, size, &c., same as on preceding day; white blood corpuscles, 23,700 per cubic millimetre. Differential count, per cent.: small lymphocytes, 23·1; large lymphocytes, 32·4; neutrophiles, 40·6; transitional, 1·6; eosinophiles, 2·7.

March 15th, 1909: Red blood corpuscles, 3,230,000; hæmoglobin, 73 per cent.; colour index, 1; vacuolation, poikilocytosis, anisocytosis, polychromatophilia, increase in average size; white blood corpuscles, 14,200 per cubic millimetre. Differential count, per cent.: small lymphocytes, 21·2; large lymphocytes, 12·6; hyaline, 3·7; neutrophiles, 55·5; eosinophiles, 3; transitional, 3·7; neutrophile myelocytes, 0·3.

CASE 2.—The patient was jaundiced when three weeks old, and was subject to occasional attacks of diarrhœa. In 1903 he was admitted, under Dr. Risien Russell, to University College Hospital for intense jaundice, which had been preceded by an attack of diarrhœa with dark motions. This attack was marked by the following symptoms in addition to the jaundice: (1) much enlargement of the liver, which reached to the umbilicus, and the presence of bile in the urine; (2) an enlarged and hard spleen; and (3) some bronchitis. Later there was the development of high fever, rising at night to 103° and 104° F., and coincident with this the development of a rapid anæmia, as shown by the blood counts. After six weeks' illness the child left the hospital anæmic but not jaundiced, with an enlarged liver and spleen. At this time the nature of the condition was unknown.

In 1906 the patient came to me with an increase in the anæmia, and more blood counts were made. At that time both the liver and spleen were enlarged.

In March, 1909, the blood was again thoroughly examined by Mr. Dennis Embleton, assistant in the pathological department of University College Hospital. In December the patient was certainly in better health than previously, and was the strongest looking of the three.

*Blood counts.*—Nov. 23rd, 1903: Red blood corpuscles, 1,904,000 per cubic millimetre; hæmoglobin, 0·46 per cent.; colour index, 1·1; white blood corpuscles, 28,280 per cubic millimetre. Differential count, per cent.: large lymphocytes, 4·9; small lymphocytes, 48·3; hyaline, 0·4; neutrophiles, 44·3; oxyphiles, 1·2; basophiles, 0·8; a few neutrophile myelocytes seen.

Dec. 10th: Red blood corpuscles, 2,084,000 per cubic millimetre; hæmoglobin, 0·36 per cent.; some chromoblasts; white blood corpuscles, 13,126 per cubic millimetre. Differential count, per cent.: large lymphocytes, 10; small lymphocytes, 41; neutrophiles, 37; hyaline, 10; basophiles, 2; some myelocytes.

August, 1906: Red blood corpuscles, 1,720,000 per cubic millimetre; hæmoglobin, 28 per cent.; colour index, 0·81; white blood corpuscles, 13,700 per cubic millimetre. Differential count, per cent.: small lymphocytes, 12·6; large lymphocytes, 8·6; neutrophiles, 75·3; transitional, 1·3; oxyphiles, 2·0.

March, 1909: Red blood corpuscles, 4,010,000 per cubic millimetre; hæmoglobin, 60 per cent.; colour index, 0·75; white blood corpuscles, 28,850 per cubic millimetre. Differential count, per cent.: small lymphocytes, 5·1; large lymphocytes, 24·2; hyaline, 6·8; neutrophiles, 57·4; basophiles, 1·0; transitional, 3·0; neutrophile myelocytes, 1·7. Average size of red cell increased.

CASE 3.—This patient, the youngest sister, was jaundiced 14 days after birth, and at 18 months the stools were noticed to be clay-coloured and since infancy to be frequently pale. She came to University College Hospital in 1906 for anæmia, vomiting, drowsiness, and constipation. It was then discovered that both the liver and spleen were enlarged and that the lymphatic glands in the posterior triangles, axillæ, and groins were also slightly enlarged. There was irregular fever rising to 103° F. and subsiding by lysis. The blood counts show the nature of the anæmia and hæmic cardiac murmurs were present. On one occasion early in the illness bile was noticed in the urine. After three weeks the child left the hospital, still anæmic and with an enlarged liver and spleen.

In January, 1909, she had a mild attack of jaundice, followed by marked anæmia, and in March I found the spleen considerably larger, reaching almost to the crest of ilium. She, like her sister (Case 1), suffers from occasional abdominal pain.

During this year her spleen has certainly increased in size, and she bears in appearance a close resemblance to her elder sister.

*Blood counts.*—August 16th, 1906: Red blood corpuscles, 2,612,000 per cubic millimetre; hæmoglobin not estimated; white blood corpuscles, 18,855 per cubic millimetre. Differential count, per cent.: small lymphocytes, 4·6; large lymphocytes, 37·3; neutrophiles, 47·0; eosinophiles, 4·3; myelocytes, 5·3; basophiles, 1·0; poikilocytosis, anisocytosis, vacuolation, polychromatophilia, some nucleated red cells.

August 23rd: Red blood corpuscles, 2,200,000 per cubic millimetre; hæmoglobin, 62 per cent.; colour index, 1·18; white blood corpuscles, 11,700 per cubic millimetre. Differential count, per cent.: small lymphocytes, 39·6; large lymphocytes, 4·3; neutrophiles, 46·6; eosinophiles, 4·3; myelocytes, 2·6; basophiles, 1·6; transitional, 1·3; poikilocytosis, anisocytosis, vacuolation, nucleated red cells. (N.B.—A small proportion of "myelocytes" might be regarded as hyaline or transitional.)

March, 1909: Red blood corpuscles, 3,285,000 per cubic millimetre; hæmoglobin, 60 per cent.; colour index, 0·8; white blood corpuscles, 24,100. Differential count, per cent.: small lymphocytes, 27·0; large lymphocytes, 7·6; hyaline, 3·0; neutrophiles, 58·0; oxyphiles, 2·0; polynuclear mixed granules, 2·0; transitional, 0·6; myelocytes, poikilocytosis, vacuolation ghosts.

These three cases illustrate some of the salient features of congenital family cholæmia, but to get a complete clinical picture it would be necessary to see them in an attack of jaundice. In fact, at the present time the name given to the

condition does not really express the exact state of affairs, which is more accurately termed, so far as these patients are concerned, a recurrent jaundice congenital in origin and associated with blood changes and an enlarged spleen.

Mr. Embleton has added some valuable details of the blood examinations, the importance of which I can best emphasise by alluding to some of the literature upon the subject. First of all, I would refer to a very helpful article by Dr. H. P. Hawkins and Mr. L. S. Dudgeon.[1] These authors publish four cases having a general resemblance to these patients, but differing in some respects. Thus, for example, their first case, a policeman, aged 27 years, always showed a markedly yellow colour, but my cases are pale rather than yellow, although at the time of their attacks of jaundice they become extremely yellow. Dr. Claude Wilson's cases, published in 1890 in the Transactions of the Clinical Society, resembled this family in the lesser degree of jaundice that was present. Cowan's two cases are also described as pale or yellowish. In Pollak's case, on the other hand, the patient was almost always yellow. Sir Thomas Barlow and Dr. H. Batty Shaw's case, that of a young man, aged 19½ years, gave a history of pallor for the first five years, and after this of a varying jaundice. It will be clear that these cases are very interesting because they have periodic attacks of jaundice, and therefore seem to hold out opportunities of discovering the relationship to one another of the three cardinal features of the condition—the jaundice, splenic enlargement, and blood disturbances.

Naturally one first looks for post-mortem evidence as likely to be helpful, and so no doubt it would be, but at present the records are scanty. Minkowsky records one in a family of eight all afflicted in this way, death occurring from double pneumonia. There had been in this case chronic jaundice with urobilinuria and an enlarged spleen, but no macroscopical or histological lesions were found in the liver. There was an excess of hæmofuscin in the liver and a pigment calculus in the gall-bladder. I would emphasise that he comments upon the absence of angiocholitis. Claude Wilson mentions another case in the family which he traced over four generations. This patient died from acute jaundice during pregnancy. The liver showed no apparent connective tissue changes.

It is noteworthy that in my cases the liver enlarged rapidly during the attacks of jaundice, but diminished in size with rapidity afterwards. Again, in all three the liver has been less completely enlarged than the spleen. Hawkins and Dudgeon also point out that enlargement of the liver is not common, but the enlargement of the spleen is a constant feature.

The balance of clinical and post-mortem evidence appears to me to suggest the view that whatever may be the original fault in this condition the liver itself only takes a secondary position in the train of symptoms and comes into prominence when there is an acute strain thrown upon it by some faulty mechanism which is the determining factor in the illness. I emphasise these points about the condition of the liver because it has been held that the first error may be an angiocholitis, itself the result of some infection from the intestines. Further, there are various kinds of congenital jaundice, in some of which it is apparent that the biliary system is primarily at fault. For example, there are the cases described by Dr. John Thomson of congenital jaundice of a familial type, which may prove rapidly fatal and cause the deaths of several children in one family. Some of these cases of minor severity may live for years, and in such the liver is enlarged, and the gall-bladder distended; there is acholia, and secondary biliary cirrhosis supervenes, but there is no great enlargement of the spleen. It would seem, then, that this is a different class of case from those under consideration, which are sometimes termed in contradistinction the Minkowski type. Gilbert and Lereboullet, however, would group both into a large family of congenital angiocholitis, but for the reasons given above and for further reasons with which I shall next deal I incline to the view that these two types are of a different nature.

It is to the condition of the blood that we must now turn for some more information. Some of the details have already been given with the account of the illnesses. There remain now some special points.

Mr. Embleton investigated these cases in the quiescent stage, by which I mean when there was neither an outbreak of jaundice nor an obviously increasing anæmia, and I will give the gist of his summary. 1. All the cases showed a certain degree of anæmia, though in each case the colour index was good. The red cells showed marked poikilo- and anisocytosis with polychromatophilia. Macrocytes predominated over microcytes. There were nucleated red cells. 2. Instead of a leucopenia there was in all cases a leucocytosis, the increase chiefly affecting the mononuclear cells. Myelocytes were present in two out of the three cases. 3. The serum had no hæmolytic power. 4. The red corpuscles were unusually fragile as tested *in vitro*. 5. There was no increase in the agglutinating power of the sera and no phagocytosis of red corpuscles. 6. There was no bile pigment in the serum of any of the cases, but the serum was darker in colour than the normal.

These investigations follow the lines laid down by Chauffard, Gilbert, and Lereboullet, and Hawkins and Dudgeon, and support some of their observations. Thus, the anæmia, the alterations in the red cells, and leucocytosis, with the presence of myelocytes, are in accord. So also are the observations on the fragility of the red corpuscles and the failure to detect any hæmolytic power in the serum.

On the other hand, the failure to find any specific agglutinating power in the serum—though in agreement with the recent experience of R. Hutchison and P. N. Panton—differs from the results obtained by Hawkins and Dudgeon. I think we must say at present that such an agglutinating power as described by these observers is not always present.

The failure to find bile pigment in the serum is not in accord with several other investigations upon this question, and in explanation of the failure it may be suggested that at the time of the investigation there was no evidence of jaundice in the skin, mucous membrane, or the urine. The sera were darker, however, than usual. Up to the present time no opportunity has occurred for examination when there has been any visible jaundice.

There is clearly no doubt that the blood is much altered in this condition of congenital family cholæmia, and the question arises whether it is a result of the jaundice. This, however, seems unlikely, seeing that in my cases there was no jaundice at the time of examination, and that in conditions other than congenital family cholæmia, in which there is persistent jaundice, such alterations in the blood do not result. It appears more probable then that the fragility of the red corpuscles may be *a cause* of the jaundice, for experimental hæmolysis, it may be remarked, provokes biliary reaction and the secretion of a very coloured viscous, thick bile. Further, Lisné and Ravant state that hæmolysis produced by injecting distilled water into the veins of rabbits produces in small doses urobilinuria, in larger doses urobilinuria and choluria, in larger still hæmoglobinuria. If the jaundice is dependent upon the blood condition then it would appear that a certain degree of severity of blood destruction is required to produce it, for in cases such as these jaundice only appears in the paroxysms of illness.

I incline, for the various reasons given above, to the conclusion as stated by Minkowski, Chauffard, Hawkins, and Dudgeon that the primary change in this disease lies *in the blood-forming*, and not the biliary, system, and I think these cases bring some additional evidence in its favour. I incline to this conclusion in spite of the warning of Hayem that stress should not be laid upon the observations made on the fragility of red corpuscles *in vitro*. These experiments which have been made in my cases with 0·1 to 1·0 solution of sodium chloride will be found detailed by Chauffard, and Hawkins and Dudgeon, and by Embleton in his appendix to Scott's and my own cases in the present volume of the Medical Society's Transactions. It seems to me, also, that Hawkins and Dudgeon's second conclusion is the probable one—viz., that we are dealing with a congenital familial defect rather than an acquired disease.

I have now briefly considered the condition of the liver and blood, and there are left the problems connected with the spleen. Unfortunately the splenic functions are so little understood that we are at once involved in difficulties which are at present insoluble. I have already remarked that the splenic enlargement has been a constant in these three cases, and has always been more striking than the hepatic enlargement. There is also, I think, a tendency for the spleen to become firmer with advancing years. Does the disordered spleen produce the blood condition or the disordered blood

[1] Quarterly Journal of Medicine, vol. ii., No. 6, p. 165, January, 1909.

conditions produce the splenic enlargement? Minkowski describes a case in which the spleen was enlarged at birth, pointing to pre-natal affection of that organ, and I am not aware of any case on record in which the spleen was at first thought to be normal in size and later was observed as enlarging; in all cases it has been found enlarged at the first examination. It is clear, then, that the disturbance of the spleen, whether primary or secondary, occurs very early indeed. Whether any observations on the most recent lines have been made on the blood at birth I do not know, but they would clearly be of interest from the point of view of the priority of the two lesions, the splenic and hæmic. With my very limited experience I would not venture to locate the exact seat of the lesions, but I picture it to be in the blood-forming organs rather than in the blood itself or spleen only, the chain of events being: (1) a congenital fault in the blood-forming organs; (2) as a consequence a faulty blood formation; and (3) as a consequence of this a disordered liver.

Two well-known conditions may receive consideration in connexion with congenital family cholæmia: (1) paroxysmal hæmoglobinuria, and (2) splenic anæmia of infants.

The occurrence in "congenital family cholæmia" of fragility of the red blood corpuscles at once suggests a relationship to paroxysmal hæmoglobinuria, and there are other interesting points of resemblance. For example, these patients feel the cold very much and are not so well in the cold seasons. Thus the eldest (Case 1) had a severe attack of jaundice in March, 1905. She broke down again in October, 1906, and again from December to March, 1909. The boy (Case 2) had an attack of jaundice in November, 1908, and again in January to March, 1909. Bettmann observed attacks of hæmoglobinuria in one of his cases when exposed to direct cold; and Claude Wilson noted in two of his cases, both of them children, that they became the colour of daffodils if they had a cold bath, this again pointing to the probable influence of cold upon the red corpuscles. On the other hand, in paroxysmal hæmoglobinuria the spleen may become large and hard during the paroxysm, and to a lesser degree and more rarely the liver may become enlarged, thus showing the implication of these two organs. G. H. K. Macalister, in a valuable article on paroxysmal hæmoglobinuria,[2] emphasizes that disturbance of the liver during the paroxysm may show itself in diarrhœa, bilious vomiting, or even slight jaundice. During the paroxysms, again, there are marked changes in the red blood cells; the numbers rapidly diminish, they are altered in shape and size, and many lose much of their hæmoglobin. There is also some increase in the number of leucocytes during the attacks, and the blood serum shows an excess of lutein the day after the attack.

There are certainly interesting resemblances in the nature of these two diseases; but, on the other hand, there is apparently an essential difference in the blood conditions. Eason and Macalister have both demonstrated the presence of a specific hæmolysin in the blood in hæmoglobinuria, but attempts to demonstrate such a hæmolysin in congenital family cholæmia have so far failed. Dudgeon, Embleton, and Painton have each reported the absence of any such specific hæmolysin. How real this apparently essential difference may be I presume only further experience can determine. Then, again, it would seem difficult to explain why hæmoglobinuria has been so exceptional an occurrence in congenital family cholæmia if the two are, as it were, different phases of one disturbance. Yet we must remember that experimental investigation has shown that when hæmoglobin is set free in the blood and the condition of hæmoglobinæmia established the urine does not show changes unless that degree of hæmoglobinæmia is high; for it would appear that the liver has great power in dealing with moderate degrees of hæmoglobinæmia. Camus, indeed, calculates that a destruction of one-fifty-seventh of the total hæmoglobin in the body may take place before any hæmoglobinuria ensues. The exceptional occurrence of hæmoglobinuria in this disease may not then after all be so inexplicable as appears at first sight.

It is tempting to hypothesise that in congenital family cholæmia the fragility of the red blood corpuscles leads under slight provocation to a moderate degree of cell destruction and cell waste. This destruction is subacute in severity and sufficiently obstinate to produce anæmia and to test to the full the powers of the liver, yet not sufficient, except in very rare examples, to allow of the presence of hæmoglobinuria. The absence of any specific hæmolysin even in small quantities in congenital family cholæmia would, however, under such an hypothesis be difficult to understand; and if one is surprised at the rarity of hæmoglobinuria in the disease one must under this hypothesis be also surprised that jaundice is not more frequent in paroxysmal hæmoglobinuria. A comparison of these two diseases is, nevertheless, interesting, and helps, I think, to bring home what a fascinating problem is that of the inter-relation of the spleen, liver, and blood.

In conclusion, if one of these cases had been under observation in the first year of life, when not in the jaundiced state, the infant would have presented an enlarged spleen, possibly an enlarged liver, and an anæmia. The blood count would probably have shown some two to three millions of red cells per cubic millimetre. Poikilocytosis would have been present, macrocytes predominating over microcytes. There would have been nucleated blood cells. The colour index would have been fair and the leucocytes increased, the increase chiefly affecting the mononuclear cells. Probably myelocytes would have been found. There would then have been considerable difficulty in distinguishing the condition from the splenic anæmia of infancy.

I am not aware of any extensive observations upon the fragility of the red blood corpuscles in splenic anæmia infantum to put beside the investigations in congenital family cholæmia. In any case from the point of view of an ordinary clinical diagnosis it is clear that there is a marked superficial resemblance between the two conditions. In arriving at the differential diagnosis stress would be laid on the hereditary and familial characteristics of congenital family cholæmia, and above all on the occurrence of paroxysms of jaundice. On the other hand, importance must be attached to the large size of the spleen and low colour index in splenic anæmia infantum. It must also be remembered that splenic anæmia infantum, although at the present time fitted into a compartment of its own for teaching purposes, is in reality but little understood, and for this reason it may be well thought over in relation to congenital family cholæmia. Even if they are totally different in nature such a comparison may help us to escape from the thraldom of diagnoses founded upon blood examinations which probably only hint at the true meaning of the various diseases with which they are connected.

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[2] Quarterly Journal of Medicine, vol. ii., No. 8.

## PHTHISIS IN CHILDREN.

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So much diversity of opinion appears to exist as to the prevalence of phthisis in school children that I have thought it worth while to review the facts, for my own and perhaps others' edification, in the light of an experience derived from many years' work in the out-patient departments of both a "chest" and a children's hospital, in addition to some acquaintance with the work in the London County Council schools.

It is obvious that the discrepancy of views arises partly from a want of agreement as to what constitutes "phthisis" in children. By some the word is used in its proper sense to denote a chronic pulmonary tuberculosis of a type similar to that found in the adult, but by others it is used, quite wrongly, to cover all cases of tuberculosis of the lungs. However misleading the term "phthisis" was in the past, especially in the days before the discovery of the tubercle bacillus, however objectionable its derivation, there is no doubt that for many years the word has stood to denote a very definite entity, and it should now be used in this sense and in this alone.

The term "pulmonary tuberculosis" may have quite other signification; I am sure it is much better never to use this term when phthisis is meant, since it is obvious that, used without qualification, it includes all forms of tubercular disease in the lungs. In the adult, to be sure, it generally stands for phthisis, but in children this is very far from being the case. Phthisis, as I hope to show, is an uncommon

disease of childhood, but no one will deny that other forms of pulmonary tuberculosis in children are, at certain ages, exceedingly common.

Some will be disposed to feel that this is perhaps a distinction without a difference, or that the difference is merely one of pathological significance, but this is not so. The disease for which the term phthisis stands is by its course, symptoms, signs, and prognosis still more distinctive to the clinician than to the morbid anatomist. What are some of its special aspects in childhood I shall attempt to indicate at a later stage of this paper.

At the outset may I bring to your notice certain facts derived from the Registrar-General's reports dealing with the incidence of tuberculosis in general? The following table shows the mortality (per 1,000,000 living at the ages stated) for different age-periods during the years 1903–07 in London:—

*All Forms of Tuberculosis.*

| Under 5 years. | 5- | 20- | 40- | 60- | 80 upwards. |
|---|---|---|---|---|---|
| 3788 | 766 | 1970 | 3313 | 2313 | 977 |

From this table it appears certain that (neglecting the type of infection altogether) the mortality from tuberculosis as a whole is far lower at school age than at any other period. This is even more so than appears, since the figures covering the school age (5 to 14) include also cases up to the age of 20 years, when phthisis begins to be common, but this is perhaps an advantage, since it cannot be denied that this mortality table covers most of those cases of phthisis which are stated by some to be so common in the schools. It must be admitted, then, that, deplorable as the mortality is at any age, at any rate the school child is marvellously free from fatal tuberculosis, and there is but little excuse for the cries of the alarmist. What is really serious and distressing is the enormous and partly avoidable death-toll below the age of 5 years which the above table so clearly demonstrates. Perhaps the relative immunity of later childhood is due to some extent to the early mortality which quickly removes the predisposed.

Our conceptions of pulmonary tuberculosis have been somewhat modified of late by the discoveries of Calmette, Guérin, and Breton, confirmed on other lines by Vansteenberghe, Grysez, and others, but still denied by some observers. These experiments seem to show that the common channel of infection in pulmonary tuberculosis of animals is not the air channels, as was formerly held, but the intestinal mucosa. In young animals it is found that the bacilli (or other particulate matter) are caught in the intestinal wall or mesenteric glands, but in adult animals they pass through these to the thoracic duct, and so by the blood-stream to the lungs. These discoveries accord well with our knowledge of tuberculosis in the human and, though we need not reject altogether the old theory of infection through the air-tubes, it seems certain that the dust-borne bacillus is given a very important second chance when, by swallowing, it is carried into the alimentary canal. The following brief summary expresses what appears to happen at different ages:—

I. *In early childhood.*—The bacilli are mechanically arrested in the mesenteric glands after passage through the intestinal wall and set up a tubercular adenitis. At the same time a few escape farther by the thoracic duct to the lungs and start a localised focus there. This is often found as an old, wedge-shaped, caseous mass in the lower parts of a lung in cases of tuberculosis of children where the thoracic glands show extensive disease. From this localised lung lesion the bronchial and tracheal glands are supplied with constant doses of tubercle bacilli, and rapidly enlarge and caseate. On this account the disease in them appears older than in the mesenteric glands when in fact the greater amount of caseation is probably due to the larger doses of tubercle bacilli supplied to them. When the mediastinal glands are caseous and the lymph channels blocked, the lymphatic stream may be reversed, and the disease spread from the glandular focus once more into the lung. In cases, comparatively few, where the mediastinal glands alone are affected, we may fairly suppose that the infection has entered through the bronchial mucous membrane.

II. *In later childhood* (in what may be described as the "school age") fatal tubercular disease is altogether less frequent, as is proved by the figures already quoted. Probably the most susceptible have already fallen victims to it. The intestinal lymphoid tissue and the mesenteric glands still arrest the bacilli, but are probably more able to deal with them. Nevertheless abdominal tuberculosis in various forms occurs in the earlier school years, and intestinal ulceration is common, whether secondary or primary, in cases dying from phthisis. The few bacilli which escape the glandular structures are carried to the lungs, but no longer set up a localised basal patch but the apical infection which leads to phthisis. This fact is due, I would suggest, to the gradually diminishing function of the apex of the lung which occurs as the respiratory movements assume the adult type. It was pointed out by Dr. Arthur Keith that the immediate apex is aerated solely by movements of the diaphragm, and in adults temporary collapse at this point can often be demonstrated and must surely predispose to tubercular infection. With growing age the diaphragm functions less and less in respiration, and hence apical tuberculosis becomes more and more common, the incidence falling especially on girls in whom the respiratory change is most early and striking. Hence the bacilli which escape the still mechanically active lymphoid structures lead to phthisis, but being scanty in numbers the disease is often extremely curable.

III. *From puberty up to adult life* the lymphatic glands gradually gain their adult structure, and arrest less and less the tubercle bacilli entering by the intestinal canal. Soon the whole brunt of the invasion falls on the lung, and as early adult age is reached phthisis becomes both a common and fatal disease. As years advance the lung tissues offer more resistance, and the prognosis becomes better and better. I offer this as a sketch of what our present knowledge appears to show as taking place at different age periods.

To turn to the *clinical aspects* of tuberculosis at these different periods we will but touch on the conditions in early childhood before turning to the subject of this paper—that of phthisis during school-age. Up to the age of five years or so pulmonary tuberculosis is nearly always an acute disease, either part of a general tuberculosis or a tubercular bronchopneumonia. The few more chronic cases are mostly those of tuberculosis of tracheal and bronchial glands with secondary lung infection, and these often become acute and generalised in their later stages. Phthisis, simulating the disease in the adult, is only a pathological curiosity.

By the time the *school age* is reached the more acute and fatal forms of early childhood are mostly left behind. In what forms, then, may pulmonary tuberculosis show itself in the school, and how can it be recognised? There are two forms in which it is likely to occur: (1) As a secondary spread to the lung from caseous tracheal and bronchial glands; and (2) as phthisis.

1. Among cases of the first group one of two things must happen.

(*a*) The disease will *spread*, in which case a condition of serious illness incompatible with school attendance is quickly brought about. These cases, in my experience of "chest" and children's hospitals, are even less common than phthisis.

(*b*) The lung tubercles are few and curable, and the case remains one of *tuberculosis of thoracic glands*. This is the real *bête noire* of the school doctor.

I think there is no doubt that a large percentage of school children suffer with tuberculosis of thoracic glands, but this can be but seldom diagnosed, though it may be often suspected. It is probable also that in a proportion of these there is a limited spread into the lungs; but that recovery both from this and the glandular disease generally occurs with no more definite signs than pallor and malnutrition being clinically evident is certain.

There is but one source from which any valuable evidence as to the occurrence of unsuspected glandular tuberculosis in children can be obtained, and that is the post-mortem records of *children picked off in full health* by some acute disease. Such records are, fortunately, obtainable (though none for this country), but as nearly all the cases were those fatal through diphtheria, it is obvious that the children were mostly below the age of five years, and many would probably have died from tuberculosis before the school years were reached. On the other hand, by increase of age the chances

of picking up tubercle increase, so the following figures can hardly err by excess if we apply them to school children in general. I would here deprecate attempts to compare *ordinary* post-mortem statistics of tubercle with conditions obtaining during life. It is obviously absurd to apply the percentage of tuberculosis found in children dying from chronic disease, including tubercle, to living children found in the schools.

| — | Councilman (Boston). | Baginsky (Berlin). | Heller (Kiel). | Hamburgher (Vienna.) | Ganghofer (Prague). |
|---|---|---|---|---|---|
| Number of necropsies ... | 220 | 806 | 714 | 150 | 972 |
| Number tubercular ... ... | 35 | 144 | 140 | 32 | 252 |
| Percentage tubercular ... | 16% | 18% | 20% | 21% | 25·9% |

Where details have been given it appears that in nearly all these cases tubercular thoracic glands were present (and often tubercular mesenteric glands also), and in about one-third of these some spread to the lungs was found. Apical lung disease was discovered in 0·5 per cent. (Ganghofer) and 0·66 per cent. (Hamburgher) among the available figures.

Here then we have, possibly in the schools, some 20 per cent. with tubercle of thoracic glands, and 8 per cent. with some spread from these to the adjoining lung. How do such cases reveal themselves? If signs were present what would such signs be? It must be admitted that enlarged glands alone give no signs unless pressure signs, and when disease has spread into the lung to such a degree as to give signs in the interscapular region the lung disease, in my experience, is progressive and fatal. If these 8 per cent. are not curable they must be fatal through one of two channels, either through lung disease as described (and this is uncommon), or through tubercular meningitis, also uncommon at these ages. In either alternative the child will not be found in the school.

As for the pressure signs, these are present in but few cases and are seldom distinctive; the commonest are enlarged chest veins and spasmodic cough, both open to other interpretation. Such signs as pressure on trachea or bronchus are very uncommon, and when such gross lesions exist the children do not remain in school. A persistent bronchial catarrh around the roots of the lungs with a tendency to areas of temporary collapse may point to some such pressure, and these signs are suspicious in a child of tubercular appearance, but are never diagnostic. On the whole, it may be said with confidence that this type of tuberculosis is rarely diagnosable in the school child, though its presence may often be suspected.

2. *Phthisis in children.*—When we turn to phthisis, on the other hand, we have a condition whose physical signs alone will, in most cases, lead to a diagnosis; indeed, in my experience the disease is less often passed over than diagnosed where it does not exist. Where the disease is at all progressive the signs are usually more evident than they are in the adult, and, I think, more rapidly developed. We must not, however, any more than in the adult, wait for physical signs before steps are taken in a case under suspicion. Unfortunately, in children it is seldom that active symptoms, as hæmoptysis, precede the appearance of physical signs, so that as a rule the signs are quite well marked by the time the case falls into the hands of the physician. Where this is not the case suspicion is most often aroused by the onset of wasting and pallor, and for these, of course, where other causes have been excluded, treatment on the lines of tubercular disease should be pursued till the location of the focus makes itself manifest.

Among the cases of tubercular disease found in healthy children dying from acute disease I have already mentioned that Ganghofer found 0·5 per cent. with primary apical tuberculosis and Hamburgher 0·66 per cent. These cases may be said to represent fairly the conditions which would be found among the living (in Prague and Vienna) at these ages, but the ages (not given) are, on the grounds already stated, probably much lower than the school age. Since phthisis becomes more common with every year of life the percentage for school age will probably be higher than this. When we turn to the clinical aspect we find the following percentages quoted by different observers for British elementary schools (urban):—

| Author. | Number of cases. | Percentage of phthisis. |
|---|---|---|
| Squire and Gowdey (London) ... ... | 1670 ..... | 0·47 |
| Lecky and Horton (Brighton) ... ... | 806 ..... | 0·37 |
| John Hay (Liverpool) ... ... ... ... | 436 ..... | 0·45 |
| Greenwood (Blackburn) ... ... ... | 400 ..... | 0·25 |
| A. P. Low (Dundee) ... ... ... ... | 517 ..... | 0 |
| R. V. C. Ash (Dunfermline) ... ... | 1371 ..... | 0 |
| Michael Hay (Aberdeen) ... ... ... | 600 ..... | 0·5 |

These may be said to agree very fairly and probably represent the proportion of phthisis, in a diagnosable condition, present among school children actually attending school.

When we turn from these to such results as those, often quoted, of the late Professor Grancher[1] of Paris, it is obvious that something quite different is meant by the figures. Professor Grancher and his assistants, among 4226 children examined, found about 15 per cent. apparently tuberculous; but to anyone who reads his paper it is apparent that the business was a conscientious attempt to diagnose thoracic glandular tuberculosis, and not phthisis. Of the 4226 children examined, "open tuberculosis" was found in but 3, and of the others, all of whom remained fit for schooling, only a very few showed even such sign as impairment to percussion. We can but commend this as an honest and useful attempt to take such cases at the earliest moment, but I would insist that the much-quoted 15 per cent. did *not* apply to phthisis. Whether their discoveries stood for disease at all is another matter; it is easy to be deceived in the interpretation of slight signs in children. How often will the areas of collapse occurring in children with adenoids simulate tuberculosis and cause doubt in the minds of the most skilful observers!

Other misleading figures to which a reference seems necessary are those of Dr. Mary H. Williams.[2] Her paper contains many fallacies and inaccuracies, and the percentage of phthisis she found (15·4) in her schools is startling till she explains that she accepts bronchitis as evidence of a tubercular process. Would that all observers were equally candid in revealing the grounds of their heterodoxy!

Many conditions in children are liable to be, and are, mistaken for phthisis, and in certain cases the differential diagnosis may be most difficult. Indeed, the interpretation of the physical signs, when found, presents far more difficulty than it does in the adult; there is more choice of possibilities and hence more chance for error, and this holds good for all varieties of lung disease in children. The following appear to me to be the conditions most frequently leading to difficulty:—

(*a*) Physiological conditions, especially blowing breath sounds at the right apex in thin children.

(*b*) Adenoids when associated with bronchitis, in which condition collapse of some standing not infrequently occurs and simulates tubercular consolidation.

(*c*) Bronchitis with signs confined to the roots, and sometimes both apices of the lungs, with or without temporary collapse.

(*d*) Conditions of bronchiectasis with or without fibrosis, especially where a whole lung is involved up to the apex. Where, as occasionally occurs, the apex *only* is involved the condition may be very difficult of diagnosis.

(*e*) Wasting conditions not dependent on tuberculosis, and especially the condition of wasting and pallor accompanying carbohydrate dyspepsia in children.

(*f*) Tuberculosis spreading from tubercular thoracic glands, though here the diagnosis is of less importance than in the conditions already mentioned.

### *The Clinical Aspect of Phthisis in Children.*

In the experience of a large out-patient clinic at my East-end "chest" hospital I have been much struck with the comparative rarity of phthisis in children compared to that in the adult. This has not been due to any scarcity of children presenting themselves for treatment, for they attend in large numbers, and I find that at my children's hospital, also in the East-end, still fewer cases of phthisis appear.

[1] Grancher: Revue de Thérapeut. Médico-Chirurg., 1906, vol. lxxiii., p. 757.

[2] Williams: Brit. Med. Jour., Feb. 13th, 1909, p. 387.

These, when found, I usually transfer to my chest hospital so the figures to be presently given for this institution err, if at all, on the side of excess. Cases are not missed, for in every case at both hospitals the lungs are carefully examined, and in most cases re-examined on one or more occasions.

With a view to discovering the proportionate incidence of phthisis in children compared to phthisis in the adult, I have studied my out-patient notes for the four years 1905-06-07-08. I find, among cases of undoubted phthisis, the following proportion of children between the ages of 5 and 14 years (inclusive):—

| Year. | Adults. | Children. |
|---|---|---|
| 1905 | 205 | 9 |
| 1906 | 226 | 4 |
| 1907 | 307 | 6 |
| 1908 | 427 | 12 |

Total: Adults, 1165; children, 31, or 2·6 per cent. of total.

In addition were found 19 doubtful cases in children, the majority being cured conditions of probable tubercular origin. Since doubtful cases were not counted among adults it is fair to exclude these in children also; if they are counted in it will make the highest possible figure 50 cases, or 4·1 per cent. of the total. On turning to the Registrar-General's reports we find the number of deaths from phthisis between the ages of 5 and 14 years to be 2·43 per cent. of the total in 1906 and 3·1 per cent. in 1907, figures which correspond very closely with those given above.

On the whole it may be accepted with much probability that less than 4 per cent. of all cases of phthisis are found in children of school age. If, now, we compare the numbers living between the ages of 5–14 years (inclusive) with those living above these ages, we find from the last Census (1901) 6,829,031 in the former category and 21,982,104 in the latter for the whole country. This may be taken to represent sufficiently nearly the proportion existing in London at the present time, and from it we find that of all persons above the age of 5 years 24 per cent. are of school age (5–14 years inclusive). If, then, phthisis were as rife at school age as in later life, 24 per cent. of cases would occur between these years instead of the 3 per cent. or thereabout of my figures and those of the Registrar-General. It is clear from this that phthisis at school age is a comparatively rare disease.

With a view to comparing some of the clinical points of phthisis in children with the disease as it occurs in the adult I have collected together cases in children (56 in all) where reliable details of the disease could be obtained. These 56 cases were distributed as follows:—

| Ages. | Boys. | Girls. | Total. |
|---|---|---|---|
| 14 years | 7 | 9 | 16 |
| 13 ,, | 4 | 8 | 12 |
| 12 ,, | 3 | 5 | 8 |
| 11 ,, | 1 | 4 | 5 |
| 10 ,, | 0 | 1 | 1 |
| 9 ,, | 0 | 2 | 2 |
| 8 ,, | 1 | 4 | 5 |
| 7 ,, | 2 | 2 | 4 |
| 6 ,, | 0 | 2 | 2 |
| 5 ,, | 1 | 0 | 1 |
| Total ... | 19 boys. | 37 girls. | 56 |

This table shows how girls were affected twice as much as boys, how great an increase of cases occurs towards the age of puberty, and, indeed, how comparatively few are the cases among younger children.

*Site of lesions.*—Among these cases the *left lung* appeared to be the earliest seat of infection in 35 cases, and the *right* in 21 cases. This is in marked contradistinction to tuberculous disease spreading from caseous thoracic glands where the right side preponderates to a marked degree. Other peculiarities about the lesions in children are the tendency to one-sided disease and the position of cavitation. As a rule the lung first attacked becomes diseased to a more considerable extent than in the adult before signs appear at the opposite side. This is an important point to remember in diagnosis, since the absence of signs at the opposite apex may lead to a wrong diagnosis of "non-tubercular" where considerable one-sided disease exists. With regard to cavitation, it is my experience that this often occurs lower down, and farther out in the lung than is usual in the adult, the top of the axilla being a common situation.

*Types of disease.*—Phthisis in children may be most conveniently and usefully divided into (*a*) cases *without* and (*b*) cases *with marked cavitation.*

(*a*) The former correspond most closely to broncho-pneumonic "caseous tuberculosis" of the adult, but in my experience run a much longer course. The disease extends a long way in one lung before the other is attacked, is slowly but surely progressive, but leads to little wasting. Indeed, the general nutrition often remains remarkably good in these cases, the child may live one or even two years, and die in the end of mere lack of aerating surface sufficient for bodily needs. The signs are those of softening, but without the presence of clinical cavitation.

(*b*) Cases with marked cavitation form, as a rule, a striking contrast to those described and correspond to "fibro-caseous tuberculosis" (chronic phthisis) of the adult. Cavitation may be, and often is, extreme, involving in some cases nearly the whole of a lung, and secondary infections, consequently, play a marked rôle in the disease. Anæmia and emaciation are generally considerable, but temporary arrest is much more likely to occur than in the cases without cavitation mentioned above, though far less common than with lesions of similar extent in the adult.

*Hæmoptysis.*—This is considered a rare symptom in phthisis of children but it occurs in a proportion of the older cases. Among 51 of my cases where inquiry was made hæmoptysis had occurred at some time in 17. Among these, one died from hæmoptysis and another from pneumonia following repeated attacks of hæmoptysis in the ward.

*Duration of life.*—The duration of life in phthisis is a difficult matter to average on account of the great variation among individual cases. Some run a short, some a long course, but I think it must be admitted that the average course of a fatal case in the child is much shorter than in the adult. Among cases in my series, only 12 in number, where I could ascertain the duration of the disease up to death, in only 1 did this reach 3 years, in 1 between 2 and 3 years, in 2 between 1 and 2 years, and in 7 the duration appeared to be 1 year or less. It must be remarked that the duration in these cases was dated from the onset of symptoms, and these tend to appear late in phthisis of children, but still it appears to me that fatal cases run a comparatively short course.

*Curability.*—Among a number of my old cases written to with a view to ascertaining their present condition the following results were obtained and are of some interest. Of 21 cases seen or heard of 9 were dead, of whom most had died within a few months, but 2 had lived 2 and 2½ years respectively since last examined. It may here be remarked what a very long time a hopeless case with advanced lesions will sometimes hang on. Eight cases, all re-examined, appeared to be cured and were at any rate arrested; 6 of these were in the first stage (Turban) and well 1–3 years (3 years in 3 cases!) later, and 2 were in the second stage, well and with arrested lesions 3½ and 4 years later. Four other cases seen were in good condition after 1 year, but with lesions still apparently active.

These figures introduce us to an important point in phthisis of children—namely, its curability. I have seen many cases (some quoted above) with well-marked signs and with tubercle bacilli in the sputum quite well and at work three or four years later, and the number of cases where cure occurs in an early stage are, I am quite sure, considerable. The consideration of such cases followed from disease to arrest brings one by a natural process to cases, sufficiently common, where slight signs, probably of arrested tubercle, are discovered at one apex. Such signs may be discovered accidentally, or may be accompanied by cough or wasting. Among the 19 "doubtful cases" of phthisis in my out-patient figures, 10 were of this nature. In these the signs consisted of impairment and deficient movement at one apex, with blowing, and in some cases feeble, breath sounds. In some cases these signs appear to correspond to an arrested lesion and are associated with symptoms which may recur or may finally disappear; in many, however, the disease appears to be cured, and I have seen such children years later in good health and with precisely similar signs. I see no reason to doubt that most of these are instances of arrested tubercle, though of course it is obvious that there are other possibilities into which space does not allow me to enter.

Before concluding this paper I must refer to the startling

results which have been obtained by the routine examination of children by von Pirquet's vaccination. As a result of this test fully 68 to 94 per cent. of children in Vienna between the ages of 11 and 14 years were pronounced to be tubercular. Such figures, if the conclusions are confirmed, serve to show in a startling manner the ubiquity of the tubercle bacillus and the importance of improving the national physique, but they have little bearing on the presence of clinical tuberculosis in the schools. It is obvious that we cannot consider 94 per cent. of such children as tubercular subjects any more than we can feel anxiety about the presence of an appendix before appendicitis shows itself. The matter is beyond the scope of the clinician, but it should give qualms to the hygienist and the legislator.

In summing up the conclusions of this paper I must recall again its main contention—namely, that phthisis is a form of tuberculosis occurring uncommonly in childhood. It must not be supposed, however, that on this account I desire to belittle the importance of the tuberculosis problem at school age; tuberculosis, especially of thoracic glands, is sufficiently common, and all reasonable measures should be taken for dealing with suspects as early and efficiently as possible. What is a much more serious matter, however, and one which demands immediate measures of prophylaxis, is the huge death-roll from tuberculosis in children *below* the age of five years, a subject outside the scope of this paper.

My conclusions are as follows:—

1. That the term "phthisis" should be reserved, when speaking of children, for a disease identical with phthisis in the adult, and should *not* be used to cover all forms of pulmonary tuberculosis.

2. That, using the term in its proper meaning, phthisis is *not* a common form of tubercular disease in childhood.

3. That fatal tuberculosis is (comparatively) uncommon at school ages, the bulk of tubercular infection during this period being localised and recoverable.

4. That phthisis, when it occurs in children, is eminently curable in early stages, but that, when fatal, it generally runs a shorter course than in the adult.

Queen Anne-street, W.

# A CASE OF JAUNDICE OF DOUBTFUL ORIGIN, WITH FATAL TERMINATION, OCCURRING DURING PREGNANCY.

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AND
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THE following case is of interest on account of the complexity of the symptoms presented and the consequent difficulty of arriving at a correct diagnosis. In order to demonstrate this it will be well, perhaps, to at once describe the history of the case.

The patient, a married woman, aged 28 years, was admitted into the Royal Hampshire County Hospital at 2 A.M. on the morning of Sept. 10th, 1909. Her past history presented no item of interest beyond the fact that she had had one child, now three years old. At 7 P.M. on the evening previous she was seized with severe abdominal pain, followed by sickness, the material brought up being first dark in colour and later clearer. The vomit was not seen by a medical man. She was given first gin, which was ejected, and later some brandy which she retained (strength unknown). These symptoms continued until 9 P.M., when they were replaced by a series of fits, simulating to all intents and purposes uræmic convulsions. These became more frequent and at 12.30 A.M. a medical man was called in, who at once sent the case into hospital.

On admission the patient was unconscious, with pulse 120, respirations 40, and temperature 96° F. Shortly after convulsions again commenced, but were controlled by chloroform and an enema containing 30 grains of chloral hydrate and 1 drachm of bromide of potassium. It was found on examination that she was about six months pregnant. A catheter was passed at once and 13 ounces of urine were drawn off. This urine was of a dark claret colour, specific gravity 1030, acid, and contained albumin and blood in large quantities. The condition was thought to be one of eclampsia with acute nephritis.

A short time later the patient was removed to the theatre with the object of inducing labour as soon as possible. No further anæsthetic was required, the patient being still unconscious, and there had been no recurrence of fits for about an hour and a half. The os was found to be soft and easily dilatable, two fingers being readily admitted. The head was presenting in the left occipito-anterior position and well down, so beyond sweeping the fingers well round the lower segment nothing was done, except that a biniodide douche was given and the vagina plugged with an iodoform tampon.

The patient was returned to bed at 5 A.M. As soon as daylight began to appear a marked icteric colour was noted on the face and body. The conjunctivæ were œdematous and oozing a serous fluid which yielded a display of colours with nitric acid, and there was oozing of dark blood from the lips, which coming at this stage diminished the probability of its being due to a bitten tongue. At 10 A.M. the condition was much the same; pulse 132, of fair volume and regular, temperature 97·4°, and respirations 40 and stertorous. Labour was apparently commencing. At 1 o'clock an enema was given, 16 ounces of urine being previously withdrawn, and shortly after she was delivered of a stillborn female child, which had apparently been dead not more than 24 hours. The child was well formed, weighed 2¾ pounds, and was 13 inches in length, the cuticle showing no maceration, but being intact all over. The placenta was small and like the membranes was stained with bile. The colour of the child was normal. The patient from this time got steadily worse, though the icteric tinge seemed to vary in intensity within short periods of time. At 8 P.M. she had a slight general convulsive attack, accompanied by a rise of temperature to 99·4°; her pulse and respiration increased and the former became irregular. The end came at 11 P.M.

A Clinical Research Association report on a specimen of urine drawn off on Sept. 16th is as follows:—

> The specimen of urine, marked ——, received on 18/9/1909, has been duly examined, and I have been instructed to forward the following report thereon:—Reaction: Acid; sp. gr. 1028. Albumin: A very large amount. Blood: *Vide infra*. Sugar: 20·41 parts per 1000, or 8·93 grains per ounce (see note).
>
> *Microscopical examination of centrifugalised deposit.*—The deposit contains only a moderate number of red blood discs, associated with granular cells, of a renal type, and a very few minute granular and hyaline tube casts.
>
> Many bacteria are present, but probably they are only adventitious. There are no traces of pus and we can detect no crystals of leucin or tyrosin, or of any other substance.
>
> The deep brown colour is due entirely to methæmoglobin, and is altogether out of proportion to the small quantity of red blood discs found in the deposit. The condition is, undoubtedly, a true methæmoglobinuria. No bile pigment is present. No reaction is obtained for acetone or for diacetic acid.
>
> *Note.*—The sugar has been proved to be glucose by the production of phenyl-glucosazone crystals.

Mr. Thornton also found the urea diminished to about half normal.

Here, then, we have a combination of symptoms which presented a considerable difficulty to us in attempting to arrive at the real nature of the disease. At first apparently we had an ordinary case of eclampsia to deal with, but from the presence of jaundice and the accompanying effusion of blood and bile-stained serum from the mucous surfaces, there was evidently something further to be explained.

Acute yellow atrophy of the liver was the most natural idea which presented itself and the condition had many points in common with the classical descriptions of that disease; e.g., Dr. J. S. Bristowe sums up his chapter on this complaint thus:—

> The most characteristic phenomena in the clinical aspect of malignant jaundice are, in combination, slight jaundice, grave cerebral disturbance, hæmorrhage from and into various organs and tissues, profound change in the composition of the urine, absence of fever, and an almost invariably fatal issue.

His remarks also concerning the pulse were corroborated by our observations, for he says:—

> The pulse is characterised by remarkable and sudden variations in frequency, but is generally abnormally quick. With the supervention of coma, however, it becomes more uniformly rapid, and at the same time more and more feeble.

Against this diagnosis we must place the acuteness of the onset and the fact that the urine showed no crystals of either

leucin or tyrosin. The liver dulness also showed no diminution, though at so early a stage this would hardly have any significance.

There is, however, another condition presenting very similar clinical signs—viz., phosphorus poisoning. Against this was the difficulty of obtaining any history of the patient having had access to phosphorus (though a stale bottle of that poison was found in the house), and the early appearance of the jaundice following the convulsions. In favour of it, on the other hand, the patient was stated to have suffered greatly from depression and had a great dread of her confinement. Her mother also is in an asylum, though, as far as can be ascertained, there is no suicidal tendency. Common to both conditions we have the state of the urine which, although not showing the presence of leucin or tyrosin, both of which substances may, or may not, be found in either case, yet presented the colour and general appearance of both possible causes. It should be mentioned that later there were large quantities of granular casts showing the acute inflammatory condition which obtained in the kidneys, and which might be compatible with either diagnosis.

The report of the urine as supplied by the Clinical Research Association from the specimen which was obtained shortly after admission, stated also that it contained "8·9 grs. per oz. of sugar (this being proved to be glucose)," and that the deep brown colour was due entirely to methæmoglobin and was altogether out of proportion to the small quantity of small red blood discs, the condition being undoubtedly a true methæmoglobinuria. No bile pigment was present in this specimen, though its presence was well marked later on. With this we conclude our remarks on the clinical symptoms and turn to the result of the post-mortem examination of the internal organs.

*Necropsy.*—On opening the abdomen the liver was somewhat enlarged, projecting slightly beyond the costal margin, and on removal considerable hæmorrhagic stains were found on the lower surface of the diaphragm. The liver weighed 64 ounces; in colour it was yellowish-red and mottled in appearance, with, on section, occasional patches of yellowish-gray substance scattered throughout the surface, the brilliancy of the colouring being still more striking in the whole organ when sliced. It was firm but not leathery, nor greasy. The stomach wall was much congested and showed hæmorrhages both fairly large and petechial. The mucous membrane was smooth and œdematous, no actual ulceration being present. The contents were dark and grumous but with no distinctive odour. In the kidneys the pyramids were much congested, and there was abundant blood-clot present in the pelves. The capsule stripped readily. The spleen was congested and friable, not apparently enlarged. The lungs and heart were normal, with the exception of a slight thickening of the mitral valve of old standing. The stomach and its contents, liver, and spleen were sent to the Clinical Research Association for further investigation, and the following report was returned:—

> The specimen marked —— received here on 21/9/09 has been duly examined, and I have been instructed to forward the following reports thereon:—
>
> The organs of this patient do not confirm the suspicion of irritant poisoning of any kind. The stomach shows no disintegration of the mucous membrane, and its congested appearance has probably the same cause as that of the liver and spleen. The liver, which is large (in phosphorus poisoning its size is diminished), shows only very small areas of hæmorrhage and necrosis, and no widespread necrosis of the hepatic cells. The spleen is much congested and shows practically no other change.
>
> The kidney presents a definite early tubal nephritis, the convoluted tubules being chiefly affected, and showing necrosis and disintegration of their epithelium.
>
> These appearances, taken with the history of the case, point to death from puerperal eclampsia and not to phosphorus poisoning or acute yellow atrophy, the presence of methæmoglobin in the urine being probably indicative of a high degree of hæmolysis of toxic origin.
>
> *Chemical analysis.*—We have examined the contents of stomach. No unoxidised phosphorus could be detected nor any lower oxide of phosphorus.

From this report it will be gathered that the histological examination does not bear out either possible diagnosis suggested by the clinical signs. We should like, therefore, to offer a few remarks bearing on the subject of this notice.

Firstly, with regard to the size of the liver. Various authors say that the liver may or may not be enlarged in acute yellow atrophy; there is, it seems, no doubt that, when the disease has continued for some time, there is distinct diminution of the liver bulk together with a leathery cut and feel and a general wrinkling of Glisson's capsule. It will be of interest to put in here the evidence of one of the greatest of observers—viz., Trousseau—since his observations clinically have not been improved upon even by the most accomplished physicians of the present day.

Trousseau in his "Clinical Medicine" mentions more than one case in which a diagnosis of malignant jaundice was made in which the liver was, or had been during the illness, actually enlarged, and quotes five (at that time eminent) pathologists who "have not only ascertained that the physical character of the liver may be normal, but believe that histological examination gives in many cases only negative results." Frerichs, on the other hand, says "that palpation and percussion enable us generally, but not always, to ascertain that there is considerable diminution in the volume of the organ"; but, goes on Trousseau, "This assertion of Frerichs is the more remarkable that a great many cases occurred in women at the sixth, seventh, and eighth month of pregnancy, a stage of gestation at which we know that there is a notable augmentation of the size of the liver irrespective altogether of any morbid condition." Could it not have been that here the symptoms were so acute that this not unusual enlargement, occurring as in this case during the sixth or seventh month of pregnancy, still persisted?

Another point on which we may be permitted to make observation is the suggestion by the Clinical Research Association that the case was one of acute toxæmia of renal origin. What else, after all, is acute yellow atrophy but an acute toxæmia, which is known to be accompanied by profound renal changes? And on this point we should like to say that we can find no evidence in the text-book descriptions of eclampsia or of acute nephritis in which jaundice has especially been noted as a symptom, though Osler, Saundby, and others describe methæmoglobinuria of toxic origin as being often associated with gross kidney changes.

In the later stages of paroxysmal hæmoglobinuria the conjunctivæ and skin sometimes assume an icteric tinge, for Hayem has found hæmoglobin in excess in the blood serum in paroxysmal hæmaturia and considers that the hæmoglobin is set free in the blood before it appears in the urine.[1]

Again, in acute nephritis and eclampsia this further very important symptom is generally pronounced—viz., suppression or at any rate very considerable decrease in the amount of urine, whereas in the case we have described as much as 29 ounces were excreted by the kidneys in about 18 hours.

What, may be fairly asked, is the element required constituting the difference between "an acute toxæmia with marked jaundice of renal origin" and acute yellow atrophy, which is undoubtedly a toxæmia, though the determining poison has not as yet been differentiated, but which is always accompanied by inflammatory changes in the kidneys? Taking into consideration the various aspects of the condition described, are we to regard the case as one of puerperal eclampsia with unusual symptoms or one of acute yellow atrophy of such rapid development that the usual macro- and micro-scopical appearances in the liver had not had time to manifest themselves?

Later researches appear now to point to the probability of acute yellow atrophy not being, strictly speaking, a pathological entity, but only constituting evidence of an eclamptic toxæmia in which the liver changes are the most prominent features, since in the more recent literature on the subject we find an article on "The Toxæmia of Pregnancy with Vomiting"[2] by Ellice Macdonald, in which, quoting Stone, he says:—

> Eclampsia is now generally recognised as a toxæmia whose chief lesion is a degeneration and necrosis with multiple hæmorrhages of the liver.
>
> The kidney changes, although forming an important part of its terminal features, are essentially secondary. All the older theories of eclampsia have been successfully applied to the condition which is described as hyperemesis gravidarum. We have also found under this latter clinical picture lesions which are identical with those occurring in acute yellow atrophy of the liver. At the same time we know but little in regard to the pathogenesis of this latter disease except that in one quarter of its cases it is associated with pregnancy, this indicating that it is probably due to a toxæmia.
>
> An analysis of its symptoms also shows it presents essentially the same clinical picture as eclampsia; in other words—under the clinical titles of hyperemesis gravidarum, eclampsia, and acute yellow atrophy of liver we have found enough to warrant a definite statement that they are one and the same disease.

The clinical history and pathological findings of the present case go a long way towards establishing this dictum.

[1] Saundby's lectures on Bright's Disease.
[2] American Journal of Obstetrics, 1905.

# INFECTIVE ENDOCARDITIS AS A COMPLICATION OF PREGNANCY.

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CASES of infective endocarditis are sufficiently rare, varied as to causation, and difficult of diagnosis to be always of interest. I am only too well aware that the two cases here described are deficient in many details which would have been of value, and my excuse for offering reports thus incomplete must be that the cases present features of peculiar interest and importance from a medico-legal as well as from a clinical standpoint. They both occurred in young women; each of the patients was the subject of an unwelcome pregnancy, and each had confessedly and to the knowledge of others been making attempts to procure abortion. In each case there was a sudden attack of severe illness, miscarriage occurred, and death rapidly followed upon a profound toxæmia. The symptoms bore the strongest resemblance to those which might have been produced by septic complications following upon abortion criminally procured by the use of instruments.

The occurrence of so sudden and tragic a fatality, under such conditions, to a pregnant girl cannot fail to give rise to the gravest suspicions and insinuations; most unjust accusations might be made, and in these the medical man in attendance might only too easily be seriously involved. In each of these cases an inquest was held, and the only verdict possible, in the circumstances, was returned—that death was due to "Natural causes," and that no attempts which might have been made to procure abortion had any share in bringing about the fatal issue.

CASE 1.—The patient was single, aged 28 years. She was said to have been generally healthy. Towards the end of June, 1908, she came to stay with friends in this neighbourhood; she was known to be about four months pregnant, but was believed to be otherwise well. She was said to have at this time taken pills, which were understood to contain aloes, in considerable numbers; even (it was thought) as many as 72 in three days. There was also a suggestion that she "had had something done" at a house in Hammersmith. She appears to have first complained of definite illness on June 30th, and "flooding" and miscarriage followed.

Upon admission, at 3.45 P.M. on July 2nd, the patient was in a cyanosed and collapsed condition. The pulse was 128, respirations 44, and temperature subnormal. There was no rash. No specimen of the urine was obtained. There was no dropsy. The chest had been blistered by poulticing. There were signs of broncho-pneumonia; dyspnœa was marked, and the sputum was blood-stained. The heart sounds were somewhat masked by the pulmonary sounds; on definite bruits were noted. Respiratory movement of the abdomen was normal; there was neither pain nor tenderness. The spleen could not be felt. The contracted uterus was palpable, the fundus reaching to within two inches of the umbilicus. A vaginal examination (on the 3rd) showed that the cervical canal was patulous and empty; a small piece of membrane was removed from the vagina. The red lochial discharge which was present at first became darker and offensive a few hours later.

The patient failed to rally under stimulating treatment. The temperature remained subnormal with the exception of a slight rise (to 101° F.) shortly before death. The pulse became weak and rapid and there was profuse sweating. The mental dulness and apathy gave place to delirium, cyanosis became more marked, and death occurred at 3.30 on the afternoon of the 3rd, just 24 hours after admission. There were no convulsions. No blood count was taken.

*Necropsy.*—There was general pulmonary congestion with patches of broncho-pneumonia, but no consolidation. The heart was of normal size and showed no signs of long-standing disease or of congenital defect. The right side revealed no abnormality of cavities or valves. The aortic valves were normal. Upon the mitral valve, on both cusps and along the whole length of the line of contact, was an irregular row of rough vegetations—some being of considerable size. There was no peritonitis. The uterus showed evidences of recent pregnancy; it was empty, but the decidual remnants and placental site were sloughing and had an offensive smell. The appendages were healthy. Nothing suggestive of instrumental interference was found. The bladder was healthy. There were no abnormal conditions of the gastro-intestinal canal, or of the liver or kidneys, so far as could be made out upon naked-eye examination. The spleen was somewhat enlarged, congested, and very soft; it contained one large abscess-cavity, evidently due to the breaking down of an infarction.

CASE 2.—The patient was single, aged 21 years. She was described as having been a healthy girl. She was thought to have had a "threatening" of rheumatic fever as a child, but not to have been at the time laid up or to have shown symptoms of serious illness. In June, 1909, she was treated for influenza and was, at the same time, found (by the medical man who attended her) to be pregnant. In August she occasionally vomited; at about this time she was known to have obtained pills and was believed to have taken them in the hope of terminating the pregnancy. So far as was known, no other steps were taken with that object. On Oct. 8th she went to begin work at a new place as general servant; she ate a full meal and made no complaint of illness. After working for some time on the following morning she complained of "biliousness" and vomited; she was found, upon the evening of the same day, to have a temperature of 103° F. On the 10th, feeling too ill to remain up, she returned to bed and was seen by a medical man, who considered that she was suffering from acute rheumatism. She continued very ill; an opinion was formed that the fœtus was dead, and (upon the 12th, when a rash was for the first time observed) she was sent to the infirmary.

Upon her admission, at 4.45 P.M. on Oct. 12th, the patient was found to be exceedingly ill. There was occasional delirium. She complained of headache and malaise, of pains in the joints, and of vomiting and diarrhœa. The temperature was 102·8°, pulse 104, irregular in time, and respirations 48. The tongue was dry and furred. The pupils were equal and reacted normally. There was no dropsy. Neither effusion nor definite pain or tenderness was found in any of the joints. There was thickly upon the face, neck, and back, and sparsely elsewhere, a discrete subcuticular rash; this in some places disappeared upon pressure, but in others was hæmorrhagic, the petechiæ being numerous upon the face and back. The rash was plainly visible through the epidermis of the palms and soles. There was dyspnœa. There was no pulmonary consolidation and no sputum. The heart sounds were indistinct, the first being blurred and the sharpness of the second being lost; no definite bruits were detected. There was no pericarditis. Such nourishment as was taken was speedily vomited, together with bile-stained fluid. The abdomen moved with respiration; there was some general tenderness; the pregnant uterus occupied the right side of the abdomen; there were no fœtal movements or heart sounds. The spleen was not felt. There was no vaginal discharge. No specimen of urine was obtained, though some was passed in the bed.

On the 13th the patient had not rallied. The temperature varied between 102° and 104°; the pulse was rapid, weak, and irregular, and the respiratory difficulty continued. The mental condition was worse. Pains in the limbs and joints were still complained off. There was frequent vomiting of large quantities of bile-stained fluid. A warm water enema produced a normal result. Urine was passed in the bed. At 1 A.M. on the 14th there was profuse sweating, and at 1.10 a fœtus of the age of over five months was expelled, the patient being apparently too dazed to realise what was occurring. The miscarriage presented otherwise no unusual features; the fœtus was macerated and had evidently been several days dead. The uterus contracted normally. Later the pulse became weaker and cyanosis more marked. The abdomen was distended, tympanitic, and tender, and there was vomiting of blood-stained fluid. Death took place at 3.15 P.M. The rash persisted. There was no œdema. No convulsions occurred. No catheter specimen of the urine was obtained. No blood-count was taken.

*Necropsy.*—A post-mortem examination was made on the 15th. The rash was almost as distinct as it had been during life, and was clearly seen even upon the palms and soles. The lungs were congested at the bases and elsewhere; there was a little fluid in the pleuræ. There was no pneumonia. The heart weighed 14 ounces; in the pericardium was an ounce of serous effusion. The cavities and valves of the

right side presented no abnormality. On the left side there was a large mass of rough vegetation upon one cusp of the mitral valve; of the aortic valve each cusp presented along its free edge a row of "warty" vegetations of considerable size; to one of them a large mixed clot was adherent; there was no perforation. There was neither evidence of long-standing disease of the heart nor congenital defect. There was no peritonitis. The uterus was empty and contracted, its appearances being consistent with the occurrence of miscarriage; the appendages were healthy; there were no signs of any instrumental interference. The bladder was empty. The stomach was in a condition of catarrhal inflammation and was distended with blood-stained fluid and (as were the intestines) with gas. The liver was not enlarged and was pale, with the exception of the congested inner zone of the lobules. The spleen was small and soft and showed no gross abnormality. In the kidneys the changes were very marked and interesting. The organs were greatly enlarged and weighed together 18¾ ounces. The surfaces were intensely congested and bore numerous petechiæ. On section the whole substance of both was found to be uniformly and densely crowded with suppurating foci of the size of small pin-heads; there were a few firm white infarcts. Sections (prepared by the Clinical Research Association, Limited) showed microscopically large numbers of septic emboli surrounded by inflammatory leucocytes and areas of necrosis of the kidney tissues. An infarct was seen to be a similar condition but larger in area and not surrounded by so much inflammatory exudate. A section stained by Gram's method showed numbers of micrococci. The right shoulder-joint (to the neighbourhood of which, in particular, pain had been referred) was examined but revealed no abnormality. No bacteriological examination was made.

*Remarks.*—These two deaths resulted from infective endocarditis, the fatal issue being possibly hastened in the second case by uræmic conditions following upon the widespread changes in the kidneys. It seems justifiable to conclude that the occurrence of miscarriage was the inevitable result of the infection and death in utero of the fœtus, and had probably (as has been said) no relation whatever to any attempts which had been made to bring about the termination of pregnancy. It is at least impossible to substantiate any theory which would connect such attempts with the causation of death.

The cases were of the "fulminating" type, though in one there was certainly some slight cardiac hypertrophy. In the excellent paper by Dr. Thomas J. Horder[1] it is remarked that "the fulminating form" of infective endocarditis "may sometimes be suspected but is rarely diagnosed"; the earlier of my cases was not diagnosed and the conditions found post mortem came as a complete surprise to those present at the examination; the second case was suspected, mainly on account of the presence of the petechial eruption. For various reasons, which need not be here referred to, no steps were taken even after death to determine the nature of the infecting organisms. Although the cases belonged to that class of the disease in which a definite source of infection has more frequently been found there was no such lesion apparent. There was no sign of gonorrhœa or of its complications, and there was no reason whatever to suspect, from the known facts, the presence of that disease.

Infective endocarditis is apparently of extreme rarity as a complication of pregnancy, though puerperal and post-puerperal cases are not uncommon. Dr. Herbert French, in his Goulstonian lectures upon "The Influence of Pregnancy upon certain Medical Diseases, and of certain Medical Diseases upon Pregnancy,"[2] makes no reference to this condition; he remarks, with regard to fevers, that "generally speaking the pregnant state seems to confer some degree of immunity, the reverse being true of the puerperium." Dr. Horder[1] found no instance of pregnancy amongst the 150 cases of infective endocarditis which he collected; he has, moreover, kindly looked through the cases of pregnancy with complications admitted during five years at St. Bartholomew's Hospital, and no such case appears to have been under observation. In most of the other articles below referred to there is no mention of this complication; Le Gendre,[3] however, records a most interesting case of a patient who was under observation at the Lariboisière Hospital from April 17th until May 6th, having then no cardiac lesion. She became again ill, being then three months pregnant, on May 15th, and was readmitted on the 21st with severe cardiac and febrile symptoms, but with no joint localisation. A yellow staphylococcus was cultivated from the blood. The patient was treated by intravenous injections of collargol. In spite of the presence of tubercular disease at the apex of one lung and of the occurrence of pulmonary infarction recovery took place and the pregnancy continued to term; a cardiac lesion remained.

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Isleworth.

# A FATAL CASE OF POISONING BY PHOSPHORUS, WITH UNUSUAL SUBCUTANEOUS HÆMORRHAGES.[1]

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THE use of phosphorus by abortionists in England is now very rare; it was never so popular here as it was a generation ago in Germany, where it was by far the most common means employed either in the form of heads of lucifer matches or vermin-killer. Latterly lead has become largely used in this part of Yorkshire and is now, practically speaking, the only metal resorted to for the purpose. During the last four years an average of about ten cases per annum of suicide by phosphorus appear in the Registrar-General's returns, though it is likely that this number should be increased by the addition of some classified as deaths from vermin-killers. In the case now recorded we infer, as so small a quantity of the paste was taken, that the girl's intention was to bring about a miscarriage, for it is notorious that suicides tend to be lavish with whatever means they select.

An unmarried girl, aged 19 years, on her mistress becoming aware that she was about two months pregnant, was summarily dismissed from her situation and went into lodgings. Towards noon on the following day she took a quantity, afterwards estimated at a drachm, of a rat poison containing about 4 per cent. of phosphorus, and within a short time complained of abdominal pain and a feeling of distension. On the next day she was unable to get up until the afternoon, and while dressing she vomited some clear fluid. The sickness recurred and was accompanied by great thirst. The bowels were not moved. She took no food whatever on this day. On the third day, after drinking tea she rose at 10 A.M., and during the morning vomited repeatedly. In the afternoon, finding her left foot swollen, evidently owing to the first subcutaneous hæmorrhage, she walked to the hospital, but owing to some irregularity on her part was not attended, and returned to her lodgings and had tea. She went to bed early and had a supper of bread-and-milk. There was thus some abatement of the symptoms on this day, as was shown by the fact that she was able to get out and also to take food. At 2 A.M. on the next day she felt so ill that she aroused the people of the house. Vomiting was frequent, blood being present in considerable quantity, abdominal pain was severe, and a profuse uterine hæmorrhage appeared. Thirst was continuous and unrelieved by the large quantities of water she drank.

The patient first came under observation at 11 A.M. on the fourth day of her illness. She was semiconscious, extremely

[1] A paper read before the Therapeutical and Pharmacological Section of the Royal Society of Medicine on Dec. 7th, 1909.

restless, perpetually turning from side to side in bed, unable to answer questions, the only reply to attempts to arouse her being an appeal for water. Hæmatemesis was frequent and the uterine hæmorrhage copious. On examination a remarkable condition was disclosed. Below the waist-line more than half of the total skin area was the seat of enormous subcutaneous hæmorrhages. The front and back of each thigh, both buttocks, the greater part of the left leg and the right foot presented continuous patches, dark purple in colour, with sharply-defined and often crescentic margins. The intervening skin, as elsewhere throughout the body, was normal. There was no jaundice. No satisfactory examination of the abdomen could be made owing to the pain and the girl's restless condition. There was incontinence of urine. The bowels were not moved. The temperature was subnormal, respirations 48, and pulse 120 and very feeble. She was admitted into hospital under Dr. E. F. Trevelyan, but died at 7.40 P.M.—less than three and a half days after taking the poison.

*Necropsy.*—The post-mortem examination was made 19 hours later. The body was that of a heavily-built stout girl, the abdominal fat being at least one and a half inches in thickness. No secretion could be squeezed from the mammæ. The large purpuric areas were already showing signs of putrefaction, the edges becoming green, and on the right thigh there were a few bullæ filled with blood-stained fluid. It was noted that there was considerable staining around the puncture made by a hypodermic needle. The brain was normal. On opening the thorax it was found that the pleural cavities contained a small quantity of dark-coloured fluid. Much hæmorrhage had occurred into the mediastinal tissues. Numerous subpleural ecchymoses were seen. The heart and lungs were normal. There was slight excess of peritoneal fluid hæmorrhagic in character. Most extensive retroperitoneal hæmorrhages were present, especially about the neighbourhood of the left kidney, while there were also hæmorrhages in the omentum and the mesentery. The liver was enlarged, weighing 54 ounces, and was of a brilliant canary-yellow colour. The liver substance bulged from its capsule on section and presented the appearance of acute fatty degeneration. There were hæmorrhages into the wall of the gall-bladder, which was thickened and gelatinous-looking. The kidneys were normal in size and on section pale yellow in colour. The stomach was filled with dark fluid material; its mucous membrane appeared normal. The uterus was enlarged and contained a hæmorrhagic mole consistent with the history of a two months pregnancy. The right ovary showed a corpus luteum. The rest of the abdominal viscera were normal in appearance. Unfortunately no specimen of urine was obtained.

Sir Thomas Oliver, who has examined microscopic specimens from the case, writes: "The liver shows signs of very advanced fatty degeneration, a large number of the cells having been completely transformed. The kidney shows very slight changes, indicating, therefore, that the brunt of the poison had been borne by the liver. The fatty degeneration so marked in character is interesting, seeing the short time the patient lived after taking the poison."

*Remarks.*—Jaundice due to blocking of the bile-capillaries is present in 80 per cent. of these cases by the third day. Though its early appearance is of serious import, speaking generally, it bears no constant relationship to the gravity of the disease or to the extent of the changes in the liver. It may well be that in some rapidly fatal cases, such as this, death comes too early for jaundice to develop. As is usual the primary symptoms—those of gastro-intestinal irritation—were marked off from the secondary signs of toxic poisoning due to hepatic failure by a period of comparative comfort on the beginning of the third day. The only symptom which did not share in this improvement was the thirst which throughout the illness was persistent and distressing. We think it likely that the massive subperitoneal hæmorrhages stood in direct causal relationship to the abdominal pain of the latter part of the illness, and we would compare this with similar conditions as they occur in Henoch's purpura and in acute hæmorrhagic pancreatitis. The subcutaneous bleedings in their wide extent were unlike anything seen in ordinary cases of purpura, and, so far as we know, have never before been recorded in phosphorus poisoning.

Leeds.

# FRIEDREICH'S ATAXIA.

BY A. ROWLEY MOODY, M.B., C.M. EDIN.

FRIEDREICH'S ataxia is a sufficiently rare disease for an account of a series in one family to be interesting, with the possibility of adding something to our knowledge of the disease or the means of successfully dealing with it.

I was consulted on May 25th, 1899, by a young woman, aged 22 years. Her father died from pneumonia when 64 years old. He had been a strong, vigorous man, and the mother, who accompanied the patient, was strong and well. Menstruation began at the age of 18 years, and for a time she was quite regular and normal in that respect, but had not been unwell for 18 months prior to the time she first consulted me. She said that she had lost a good deal of weight, did not sleep in the early part of the night, was subject to dreams, and was not refreshed in the morning. Her mother said she twitched and talked in her sleep, and that she was a good deal upset mentally, often brooding over the disease which she believed she had inherited, and which she thought was attacking her.

The patient had noticed an increasing difficulty in getting about for six or seven years and was afraid she was going like her sisters and brother. She first noticed that she was clumsy and easily tripped up and could not run. She stood with feet apart and turned somewhat inwards, with the body and head inclined forward. The gait was unsteady and clumsy and zig-zag. The unsteadiness was slightly increased by closing the eyes, but markedly so on turning, so much so that she had to clutch at something fixed; occasionally jerky and irregular movements took place in the legs, arms, and neck. These symptoms, the mother said, were more pronounced in bed at night.

On asking the patient to pick up a pencil the hand and arm, instead of coming in one continuous line to the object, made several jerky, hovering movements as if uncertain of their aim or wishing to put the object off guard that it was intended to seize. Eventually she took it with a clutching, hurrying grasp. The front part of the foot had to be raised by bending the knee more than usual to clear the floor, but there was no thumping down of the heels. There was some delay in commencing any movement. Mentally she was alert and intelligent, but the face was expressionless except for the eyes. At the same time she was able to laugh and to smile, but it suggested an effort to do so. The speech was slow, hesitating, and delivered in as few words as possible with a monotonous scanning intonation. There was great delay in commencing replies to questions, so much so that I thought at first she did not intend to answer at all. There was well-marked lateral and antero-posterior curvature of the spine.

There were no areas of anæsthesia, no neuralgia, no crises. The pupils reacted normally for light and distance. There was no optic atrophy; the sight remained still good. There was no nystagmus at that time. There was complete normal control of the bladder and the other organic reflexes were normal. The knee-jerk was absent in the left leg, but there was a slight movement on the right side. The hands were not deformed, but hung listlessly in her lap or by her side; the feet were turned a little inwards.

In view of the bent condition of the spine and the evident difficulty in keeping herself erect, as well as to alleviate any irritation in the cord which would be produced or increased by this altered position, a well-fitting poroplastic jacket was applied, and in consideration of the probable developmental origin of the disease she was put upon a course of thyroid tabloids, and in the course of a few years ovarian tabloids were added. Both of these tabloids she has continued intermittently up to the present time.

I examined her recently and found there was still the same incoördination, but the paresis had not appreciably increased in the legs or the arms. The knee-jerks were completely absent in both legs. There was no deformity of hands or feet. She was no thinner. Nystagmus was present on turning the eyes in a constrained position. The speech has remained the same in general character, but now there is no delay in replying, and there is more animation. The expression of the face and the attitude are as first described.

On going into the family history I found her family were

yeomen farmers, and for several hundred years had owned and lived at their farm. This is situated in one of the healthiest districts in the kingdom, where the people are notoriously robust and hardy. They have records of several intermarriages amongst relatives, probably brought about by the desire to keep the property in the family. The father and mother were second cousins, and were much above the average in physique and strength. The mother says her grandmother suffered in the same way as these children. There were nine children, five of whom are healthy and four developed this disease.

The eldest child, a girl, was said to commence the disease at the age of 14, and died from it at the age of 26, being then unable to leave her chair to which she was lifted out of bed. The feet and hands, they say, were deformed in the same way as the two cases that follow.

The eldest son commenced to show symptoms between 13 and 14 years of age. When I saw him he was a man of enormous physique, 6 feet 2 inches in height, and broad in proportion. He was helped from bed every morning into a specially made massive and immovable chair where he remained all day. His mental powers were good, his speech and facial aspect were as described in the first case, and the eyes were normal; there was complete paresis of the legs with great stiffness, and the legs were swollen to an enormous size, with the skin coarse and pitted, almost suggesting elephantiasis. The feet were characteristically deformed, short, stumpy, with high-arched instep, with the toes over-extended at the interphalangeal joints. When I first saw him there were a number of deep excavated foul and painful ulcers in the legs; these, they said, had been caused by slight knocks. They slowly disappeared after prolonged treatment, and as great care was exercised not to knock them there was no recurrence. He said that the least scratch or cut was difficult to heal. The paresis was almost complete in the arms and hands; he could, however, lightly grasp between the index and second fingers; the thumb was entirely useless. The manus cava was well marked. Lateral nystagmus was also present in fixing the eye at an unusual angle. There were no crises, nor neuralgias of any kind. The feet were drawn inwards so that they rested on their outside edges. He died eight years ago from pneumonia at the age of 42 years.

The next child affected, a girl, showed symptoms first at the age of 14 years. She was able to get about up to the age of 35, but is now unable to walk or feed herself. She has slight power of movement in the arms and only with great difficulty can grasp a pencil, when it is held up to her, between the index and second fingers. Her feet and hands show the pes cavus and manus cava symptoms in a typical manner. Nystagmus is present. The speech is thick and monotonous and the attitude and facial expression are similar to the cases already described, with well-marked bending of the spine. The eyes are normal and the sight is good. She complains of no pain and says she should be well if she only had the use of her limbs. During the last two years her legs have begun to swell, and the swelling is now well marked, but not extensive, from three inches below the knee downwards. The swelling does not pit easily on pressure and the skin in the affected part is beginning to get coarse, but there are no ulcers.

The second son, although not afflicted with this disease, is mentally deficient. He is, however, a well-grown powerful man. With this exception, all the children are mentally much above the average and are fine specimens of humanity, one son having a wide reputation as an athlete.

The only case which has been treated for the constitutional disease is the one first described, and in view of the fact that the disease had already existed for nearly eight years and taking into account the age of the patient when treatment was commenced, I think that we may regard the progress of this case as favourable. It is impossible to say that the disease has been arrested; in fact, in the nystagmus and knee reflexes the disease has made some headway, but, as the history shows, slight improvement has taken place in some respects. Further, the locomotive powers and the use of the arms are quite as good now as they were when I first saw her 11 years ago.

It would be interesting to know the result of continuous treatment of the same kind applied in the early stages of Friedreich's ataxia, especially in young patients in whom active development is still progressing.

The history of these cases strongly supports the theory that the disease is hereditary, and bears out the idea that it may be caused by some error in the developmental forces, which is not accidental and which may possibly arise in some cases from consanguinity. But apart from the interest in the hereditary character of this disease to which this range of cases clearly points, there are some clinical aspects which I have not seen recorded hitherto. Œdema appeared in the three children who had suffered for the greatest number of years and was a symptom which developed late in the course of the disease and which progressed *pari passu* with the paresis. At the same time the skin also underwent a progressive change, becoming in the first place coarse and pitted and eventually assuming almost the appearance of elephantiasis. In these cases it was associated with trophic ulcers, which, however, were different from the ulcers found in cases of locomotor ataxia and other spinal lesions in that they were markedly painful.

Shelton, Stoke-upon-Trent.

## DISPLACEMENTS OF THE SEMILUNAR CARTILAGES.

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CERTAIN joints in man possess interarticular fibro-cartilages, namely, the knees, the temporo-mandibular articulations, the sterno-clavicular joints, and the joints between the bodies of the vertebræ. The triangular cartilage separating the inferior radio-ulnar from the wrist-joint is an additional instance. In each case the interarticular cartilage forms a more or less complete partition, producing a double joint, each part of which has its own distinct movement—a movement which (except in the case of the intervertebral joints) is of a different kind from that of the neighbouring part.

In the knee, on the femoral side of the interarticular cartilages, hinge motion of flexion and extension takes place; on the tibial side a slight degree of rotation is permitted during flexion. In the temporo-mandibular joint a gliding backwards and forwards takes place above the interarticular fibro-cartilage, whilst below the cartilage hinge movements of opening and closing the mouth are possible, together with some little rotation. In the sterno-clavicular joint up-and-down movements are said to occur on the clavicular side, and forward and backward movements on the sternal side of the interarticular cartilage. The triangular cartilage, uniting the radius to the styloid process of the ulna, by its upper surface axially rotates on the ulna during pronation and supination, but its lower surface helps to form the wrist-joint proper at which backward and forward or lateral movements can occur. The spine gains increased range of movement from the duplication of the intervertebral joints by the discs, but the kind of movement in adjacent synovial sacs is similar.

With the exception, therefore, of the intervertebral joints, the *variety* of movement in a joint is increased by the presence of interarticular cartilage. Should an interarticular cartilage lose its attachment, it is liable to shift its position and interfere with the mechanism of the joint. This is evidenced in the internal derangements of the knee and of the temporo-mandibular articulation. The other interarticular cartilages in man are so securely anchored as to resist detachment. The general rôle of interarticular cartilages has thus been outlined. In the special case of the knee certain points in their structure and function require closer examination.

The general shape of the cartilages is suggested by their name—semilunar. But there are two important points in their conformation which are less frequently emphasised. In the first place, they are wedge-shaped in section, with the apex pointing into the centre of the joint (*vide* Figs. 1, 2, 3, 4), and so, considering that both upper and lower surfaces are smooth and freely lubricated with synovial fluid, it is difficult to imagine that a normally lubricated, undetached cartilage should become severely squeezed between femur and tibia. In the second place, whilst the lower surface of each cartilage is flat, gliding easily on the flat top of the tibia, the upper surface is concave, so that each semilunar cartilage forms a socket for one femoral condyle. The oval shape of

the internal semilunar cartilage is associated with the greater antero-posterior surface of femur in contact with it during complete extension. During flexion the internal condyle of the femur is in close articular contact only with the posterior portion of the internal semilunar cartilage. (Fig. 1.) The base of each wedge-shaped cartilage is planted fairly upon the capsular ligament, the fibres of which pass into the fibro-cartilage.

FIG. 1.

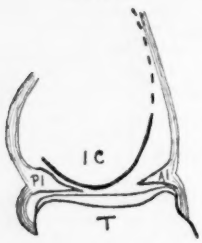



FIG. 2.

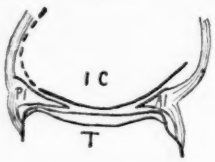



FIG. 3.

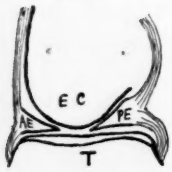
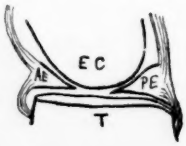



FIG. 4.




FIGS. 1, 2, 3, 4.—I C, Internal condyle of femur. E C, External condyle of femur. T, Upper end of tibia. A I, Anterior part of internal semilunar. P I, Posterior part of internal semilunar. A E, Anterior part of external semilunar. P E, Posterior part of external semilunar.
These figures are diagrammatic sections: 1. Through the internal condyle in flexion. 2. Through the internal condyle in extension. 3. Through the external condyle in flexion. 4. Through the external condyle in extension.
Note the wedge-shape of the semilunar cartilages in section, their superior concavity, and that the internal condyle only completely occupies the internal semilunar in extension. In flexion it does not touch the anterior end of the semilunar; the ligamentum alarium fills the interval. The diagrams also show the anterior part of the capsule tight and the posterior part of the capsule relaxed during flexion.

The so-called "coronary ligament" is nothing but that piece of the capsule, stretching from the periphery of the cartilage to the tibia, which has a length of about half an inch and upwards. Since the cartilage is attached to the capsule much nearer the tibia than the femur, it follows that it has closer tissue connexion with the tibia than with the femur. And this at first sight is what renders the separation of semilunar from tibia difficult of comprehension. But it must be remembered that if there be no direct anatomical union of femur and semilunar there is, nevertheless, in virtue of the upper concavity of the semilunar a close functional union, inasmuch as the femoral condyles are firmly fixed in the hollows of the semilunars by the weight of the body, atmospheric pressure, and muscular tone. So strong is this union that in excessive rotation at the knee the semilunars tear their capsular anchors before parting company with the femoral condyles with which they have only indirect tissue connexions.

The chief movements at the knee are flexion and extension. Such movements can only take place between the femur and the interarticular cartilages. For, below the cartilages, the opposed articular surfaces are approximately flat. A peculiar kind of rotation accompanies the last stage of extension and the first stage of flexion. Owing to the greater antero-posterior articular surface of the inner condyle of the femur the completion of extension at the knee is accompanied by a slight rotation outwards of the tibia on the femur. This rotation has the effect of diminishing muscular strain in the erect position; partly because of tightening of all the ligaments; partly because, as hinge movements cannot occur without some rotation taking place, and as, in the erect position there is no tendency to rotation as there is to flexion, only slight tone of the biceps is required to maintain the attitude. But apart from this the flexion and extension are not the movements of a hinge joint for the parts of the femur in articular contact are constantly changing. It is probable that during extension the forward roll of the lower end of the femur (Fig. 5) will tend to sweep any loose body in the front of the joint backwards into its centre, and thus may be explained the presence of a displaced anterior end of the semilunar in the intercondyloid notch, a condition of things sometimes dis-

FIG. 5.

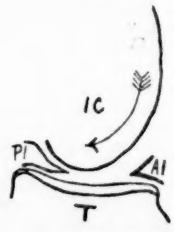


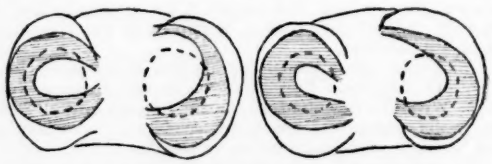

Diagram to show the "roll" of the femoral condyles during extension owing to fresh parts of the femur coming into articular contact. I C, Internal condyle here shown in flexion. T, Upper end of tibia. A I, Anterior end of internal semilunar cartilage. P I, Posterior end of internal semilunar cartilage.

closed at operation. It is absurd to suppose, however, that this tendency could result in detachment of a healthy semilunar cartilage. Moreover, the first detachment of a semilunar cartilage does not occur during sudden extension of the knee.

In addition to flexion and extension anatomists describe a rotation which takes place between the semilunar cartilages and the tibia. I have heard it said that such movement does not occur and that the apparent rotation really takes place at the foot. That there is real rotation of the tibia when the knee is flexed is shown by the alteration of direction of the inner surface of that bone. This is proved also by the fact that, where the foot and ankle are immoveably cased in plaster-of-Paris and the thigh fixed, some abduction and adduction of the foot still occur, and these movements could then only be produced by rotation at the knee. If a spring-clip with a pointer attached be made to encircle the lower part of the leg where the bones are subcutaneous the degree of rotation can be fairly measured. The range of inward rotation is about twice as great as that of outward rotation.

This rotation below the semilunar cartilages does not occur in the fully extended limb, for then nearly all the ligaments are tight. Indeed, when everything is severed except the crucial ligaments, these are still sufficiently taut to prevent the slightest rotation. (The inability to rotate has nothing to do with the adaptation of bony surfaces in extension, for

FIG. 6.



Diagrams to show rotation of the tibia below the semilunar cartilages during flexion of the left knee, as seen from above. The simple outline is that of the upper end of the tibia, the shaded areas denote the semilunar cartilages, the dotted circles are intended to represent (quite diagrammatically) the femoral condyles. The left-hand diagram is of a flexed knee without any rotation of the tibia; the right-hand diagram is of a flexed left knee showing a slight degree of outward rotation. The front of the joint is above in the diagrams.

in all positions the articulating plane of the tibia is a flat surface.) The rotation during flexion is permitted by the lax state of the ligaments. The mechanism of this rotation can be seen in any dissected joint. Each semilunar cartilage is firmly fixed by its ends to the middle of the joint. Peripherally the capsular attachments are lax. In rotation the tibia rotates beneath the cartilages, so that relatively to the upper surface of the tibia one cartilage swings forwards

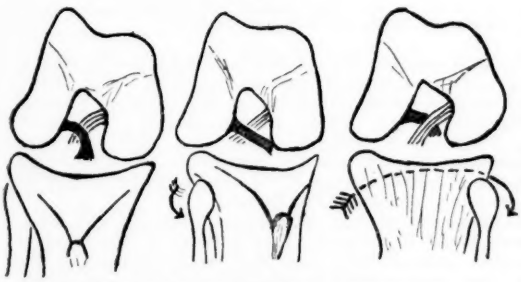
and the other backwards, each, of course, maintained in contact with the corresponding femoral condyle. (Fig. 6.)

Though the range of this rotation is slight its value is considerable. It adds to the fine adjustments of the foot which are required in running over unequal ground, and, what is perhaps more important, must play a great part in checking dislocation of the knee. If it were not for the slight "give" of the semilunars, any sudden wrench during flexion would be sufficient to throw the condyles of the femur off the tibia. Of course, the semilunar cartilages also tend to prevent dislocation by forming a socket, if a shallow one, for the femur. But if they were fixed to the tibia as the cotyloid ligament is fixed to the acetabulum, a sharp twist would still risk dislocation.

Outward rotation of the tibia at the knee is produced normally by the biceps muscle, inward rotation by the popliteus and inner hamstring muscles—viz., sartorius, gracilis, semitendinosus, and semimembranosus. Abnormally severe twists are caused by indirect violence usually applied to the foot, and there is detachment of the semilunar from the capsule and so from the tibia. These severe forms of violence are considered subsequently.

Inward rotation of the tibia is checked by a "winding up" of the crucial ligaments. Outward rotation is first checked by the attachment of the anterior end of the internal semilunar cartilage to the front part of the capsular ligament. Thus it is upon this portion of the attachment of the periphery of the internal cartilage to the capsule that chief strain is likely to fall. The action of the crucials is well seen if a knee-joint be denuded of all its ligaments except the crucials, and be flexed to a right angle. The tibia then can only be rotated inwards some 20°, but can be rotated outwards through two right angles so that the anterior border looks almost directly backwards (Fig. 7).

FIG. 7.



Three diagrams of the flexed knee-joint to show the action of the crucial ligaments in rotation of the tibia. All the other ligaments have been divided. In the left-hand diagram there is no rotation. The middle diagram shows inward rotation of the tibia checked early by winding up of the crucial ligaments. The right-hand diagram shows outward rotation continued through nearly two right angles, so that the back of the tibia is now in front. Outward rotation of the tibia first unwinds and relaxes the crucial ligaments. Hence these interosseous ligaments check inward, but not outward, rotation. The anterior crucial is black, the posterior crucial is lined in the diagrams.

Strain does not come upon the attachment of the posterior ends of the semilunar cartilages to the capsule, because rotation only occurs during flexion of the joint and the posterior part of the capsule is then relaxed and can follow either cartilage forwards, as opposed to the anterior fibres of the capsule which are tense, especially if the vasti be acting.

The semilunar cartilages are composed of fibro-cartilage. Cartilage is the one tissue in the body which can stand extreme pressure and friction. So that the laceration and pathological changes seen in displaced semilunar cartilages can hardly be due to squeezing between tibia and femur. If they were, since action and reaction are equal and opposite, one might expect the adjacent articular cartilage of the femur and the tibia to show similar changes, which, I believe, they do not in any recent case. The blood-supply of the semilunar cartilages comes through their peripheral attachments to the capsule; when a cartilage is detached its blood-supply is interfered with and it undergoes degenerative changes and may then be secondarily affected by pressure between femur and tibia. The smoothness of surface is lost, degenerative changes may follow, and the whole mass if sufficiently detached may be carried by the "roll" of the femur into the centre of the joint. I suspect that the pain of "slipping of a cartilage" is due to pull upon, and laceration of, the capsular attachments and not to any "squeezing" of a probably[1] insensitive fibro-cartilage. Any initial crushing of a cartilage, the attachments of which have not been lacerated, is well-nigh inconceivable.

Certain facts appear prominently in the histories of cases of internal derangement of the knee. The injury is rarely due to direct violence. The patient has often fallen, but the fall is the result rather than the cause of the injury. It is usually the indirect application of force which determines the lesion. The knee at the moment is almost always in some position of flexion, the quadriceps extensor muscle is often contracting, and commonly the weight of the body is being transmitted partly through the articulation. But the exciting force is a rotary one, either a twist of the foot when the thigh is more or less fixed, or a twist of the femur as the whole body swings round whilst the foot is, for instance, firmly planted on the ground. These points are illustrated in most careful accounts of the accident. The following are some of the usual methods of meeting with the injury. They have been taken from some of the reported cases and also from an examination of 100 consecutive cases which were operated upon at Guy's Hospital up till the end of 1907.

1. A slip or twist whilst running, walking, or dancing. The wrench at the knee, especially in recurrent cases, is often of a trivial nature.

2. Catching the inner side of the fore part of the foot against some obstruction, or catching the foot in a hole, or between two planks.

3. Turning suddenly on one leg, as in dodging a vehicle in the street, or as in football, golf, cricket, tennis, or gymnastic exercise.

4. Slips or short falls on to one leg, (with the foot in the abducted position), stepping off a platform on to the permanent way, or stumbling downstairs. The patient often describes his falling with "one leg doubled under him."

5. Being tripped up as in wrestling or football.

6. Attempting to rise after squatting some time upon the toes or kneeling with toes turned out.

7. Turning over in bed, the foot being restrained by the weight of the bedclothes. This is by no means so rare as might have been expected. A young woman, aged 21 years, "turned round in bed to stop an alarm clock and felt something go in her knee and the knee began to swell." Considerable displacement of the internal semilunar cartilage was found at operation.

8. Climbing a ladder or going upstairs, the former especially necessitating outward rotation at the knee.

9. Kicking at a football with the inside of the fore part of the foot, chiefly in the case of one unaccustomed to play. 14 of the 100 cases collected from the Guy's Hospital records were ascribed to football. Most of these would come under the headings 3 and 5.

10. The foot may be caught in some moving structure, as in the spokes of a revolving wheel.

11. A small number of cases have been reported as the result of direct violence. Except for these few cases nearly every accident was due to a twist or wrench.

It will be seen that whether the foot is twisted or whether merely fixed whilst the body rotates, an important factor is the leverage afforded by the projection of the foot at right angles to the leg. Man pays for the privilege of being a plantigrade animal by his liability to injuries of the lower limbs by rotary violence. The outward twist of the foot exerts a more powerful strain than does the inward. For to turn the mass of the body by twisting the foot outwards requires more force than to do so by turning the foot inwards. Moreover, the usual attitude of out-turned toes invites the outward rather than the inward twist. Most of the *indirect* injuries of the lower limbs are due to this outward twist: Pott's fracture-dislocation (with it spiral fracture of the

[1] Quain's Anatomy, 1891, vol. i., Part II., p. 250, under heading of "Fibro-cartilages": "No nerves have been traced into any of the cartilages, and they are known to be destitute of sensibility." Moreover, in a case of displaced internal semilunar cartilage, in which complete extension of the knee was impossible, owing (as disclosed at operation) to part of the internal cartilage lying between the ends of the bones, the patient could bear his whole weight upon that leg without pain, and considerable force could be painlessly expended in attempts to straighten the knee.

fibula, so clearly demonstrated by Mr. W. Arbuthnot Lane), spiral fracture of the bones of the leg (where the fibula in consequence breaks at a higher level than the tibia), the usual displacement of the internal semilunar cartilage, spiral fracture of the shaft of the femur, and intracapsular fracture of the neck of the femur. The particular lesion which follows the outward twist of the foot is determined by the position of the rest of the limb, the age of the individual, and like factors.

In a careful investigation of the clinical histories it will be found that many semilunar displacements are certainly due to outward rotation, which is what one would expect; for the position of the foot invites outward rotation, outward rotation imposes a greater strain, and it is not checked by the crucial ligaments as is inward rotation.

Sir William Bennett has described exactly the pathological anatomy of internal derangements of the knee occurring in his large surgical experience of these cases. He finds the larger proportion involve the anterior end of the internal semilunar cartilage, the anterior two-thirds being more or less torn from the capsule or even the anterior end of the cartilage also detached. Whilst this is the common condition, injuries of the posterior part of the internal semilunar and also injuries of the external semilunar cartilage occur in a proportion of cases. Some of the lacerations of the posterior part of the internal semilunar cartilage found in addition to partial detachment are possibly produced during the removal of the cartilage, since they may be mimicked in removing normal cartilages post-mortem.

The common semilunar displacement is due to violence applied to the foot usually in an outward direction. It is difficult to give statistical proof for this statement as accounts of the accident rarely state whether the "wrench" was outwards or inwards. (It must be admitted that the patient sometimes states that the foot was turned inwards at the first accident.) The tibia rotates outwards beneath the semilunar cartilages which cap the femoral condyles. As the knee at the time is flexed there are no tibio-femoral ligaments which can limit outward rotation of the tibia. The strain may be expected to fall upon the capsular attachments of the anterior end of the internal semilunar and the posterior end of the external semilunar cartilage. As the posterior part of the capsule is relaxed it can follow the external semilunar into the joint. But the anterior part of the capsule is taut and the internal semilunar cartilage adhering to the femoral condyle is dragged from the capsule in front (Fig. 8) and shoots with a click into the joint.

FIG. 8.

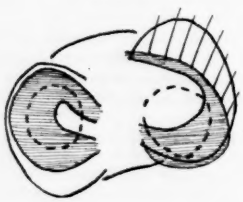
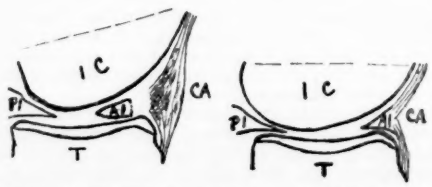


Diagram to show excessive outward rotation of the left tibia below the semilunar cartilages during flexion of the knee, as seen from above. The simple outline is that of the upper end of the tibia, the shaded areas denote the semilunar cartilages, the dotted circles are intended to represent (quite diagrammatically) the femoral condyles. The lines radiating from the anterior two-thirds of the periphery of the internal semilunar cartilage mark the region of greatest strain. Compare the two diagrams in Fig. 6. The front of the joint is above in the diagram.

Even the anterior cornu may be detached and the loose part be rolled into the intercondyloid notch; or the periphery of the cartilage may remain on the capsular ligament and only the inner margin be torn away; or, the anterior end of the cartilage maintaining its hold, the femoral condyle may subsequently ride over the peripherally detached cartilage, which will then turn over into the joint like the "handle of a bucket," as it has been aptly described.

During flexion any loose portion has room to lie free in front, but the greater antero-posterior length of the fully extended internal condyle can spare no room, so that unless the displaced cartilage be restored to its normal position complete extension cannot occur, and the so-called "locking" of the knee ensues. (Fig. 9.) Short of complete rupture of the peripheral attachment there may be laceration with hæmorrhage. This may give rise to a loose body in the joint, or even by its size may push the semilunar cartilage inwards, preventing extension, and, as Sir William Bennett pointed out, only slowly absorbing, the condition is not susceptible of manipulatory reduction. Laceration of the capsular attachment will give rise to the sickening pain, the local tenderness, and the effusion into the joint. Complete extension may be impossible. Its attempt does not always give rise to severe pain. The relaxed condition of the ligamentum patellæ first described in Hey's original paper

FIG. 9.




Diagrams to illustrate incomplete extension of the knee in a case of displacement of the fore part of the internal semilunar cartilage. I C, Internal condyle of femur. T, Upper end of tibia. P I, Posterior end of internal semilunar cartilage. A I, Anterior end of internal semilunar cartilage. C A, Anterior part of capsule.

The right-hand figure shows normal complete extension. The left-hand figure shows the capsule lacerated and slightly swollen, and the anterior end of the internal semilunar cartilage separated from the capsule and displaced inwards into the joint. Note how the slight elevation of the anterior part of the upper surface of the inner tuberosity of the tibia tends to prevent the anterior end of the internal semilunar cartilage from being squeezed back during extension of the knee after displacement has once occurred.

may signify relaxed tone of the quadriceps, and so diminution of tension upon the lacerated capsule. More often, perhaps, the relaxed condition is the result of repeated effusions into the joint. Strong outward rotation of the tibia gives rise to pain over the peripheral attachment of the internal semilunar. Strong inward rotation is painless. But if the knee is locked it may be impossible to produce any rotation.

It is easy to see how conservative treatment may sometimes result in benefit. The cartilage, if displaced, is reduced by manipulation; its base lies in contact with the lacerated capsule, and, if all rotatory movements are avoided, adhesions will form. The subsequent use for some months of an Ernst apparatus, which prevents the least rotation at the knee whilst permitting flexion and extension, may result in a cure. The wearing of a boot with sole and heel higher on the inside has been employed to favour adduction and inversion of the foot. The avoidance of exercises, such as football and hockey, which involve twisting on the legs, is imperative. The patient is told to walk with the toes straight in front and not turned out.

The normal and pathological anatomy, the clinical histories and symptoms, the conservative methods of treatment which occasionally meet with success, all favour the view that excessive outward rotation of the tibia beneath the interarticular cartilages produces a laceration of the capsular attachments of the fore part of the internal semilunar cartilages which is the usual lesion in this class of injury.

I wish to express my indebtedness to Mr. G. F. Stebbing for his valuable advice and criticisms in connexion with this paper.

HOSPITAL FOR SICK CHILDREN: POST-GRADUATE CLASSES.—The winter session of lectures and demonstrations at the Hospital for Sick Children, Great Ormond-street, commenced on Jan. 13th, when Dr. A. E. Garrod demonstrated selected cases from the medical wards. On Jan. 20th Mr. E. M. Corner will treat of Appendicitis and its Treatment in Children. The lectures are given at 4 P.M. on each Thursday and are free to all qualified medical practitioners.

## A CASE OF SEPTIC INFECTION CONSEQUENT ON MASTITIS.

BY ALEXANDER D. PITHIE, L.R.C.P., L.R.C.S. EDIN., L.F.P.S. GLASG.

THE patient in the following case was a married woman who was confined prematurely of an eight months' child on June 4th, 1909, and made a fair recovery. Her highest temperature during the first month was on the fifth day, when it was 99° F., with a pulse-rate of 102. In the right breast she had no milk, and in the left only a little, but not enough for the child, who accordingly had to be fed with the bottle. The left breast ached from the time the child was put to it till the time of sitting up, when it felt so heavy that the nurse supported it with a sling on the tenth day, after which it was more comfortable. At the end of the first month the patient menstruated, when the left breast became very tender and ached, a lump appearing which was so tender to the touch that she could only lie on her back. The district nurse then advised hot fomentations for four days, when the pain became less, but when the next period came on the pain was worse, and at the time of the third period, or about Sept. 4th, there was found a lump of the size of a walnut, which became inflamed and shiny, forming an abscess, which broke on Sept. 25th, and offensive thick yellow pus was discharged. She still continued the fomentation for ten days. The nurse saw her on Oct. 5th, and kept her in bed; the temperature was normal, but the patient was very weak and on that night she had a rigor, with sickness and faintness.

When called to see the patient on Oct. 7th I found her in an almost collapsed condition, with a temperature of 103° F. and a pulse-rate of 100, the temperature rising that night to 104·8°. The breast was red but not swollen, the redness being more of a skin rash. To the left of the breast there was an opening which was evidently superficial, as a probe could not be inserted to any distance, but no evidence of pocketed pus could be found. No other condition to account for the high temperature could be detected. Strychnine and quinine were administered and the temperature gradually came down till the 11th when it suddenly rose again to 105°. This time not only the breast but also the whole of the chest and upper part of the abdomen became covered with the rash which was of a bright red colour. The right breast also became painful and a painful spot appeared on the left shoulder. No evidence of suppuration was to be found. The patient at this time had the appearance of a person *in extremis*. I then injected 10 cubic centimetres of Allen and Hanburys' polyvalent antistreptococcic serum in the walls of the abdomen, repeating the injection in ten hours. As the vomited I decided to give it per rectum, which was carried out for the remainder of the treatment. For the first three days she retched after each dose of serum, but then tolerance was established and the nausea passed off. Administration of serum was carried out three times a day until the 15th when it was given twice daily, and then once a day till the 18th, when it was stopped, the temperature being normal and the pulse-rate 88. Her condition otherwise was very good and all appearances pointed toward a sure convalescence. On the 26th, however, the temperature once more began to increase, being 100·2° in the morning and rising to 102·4° the next morning, when a small superficial lump was found on the left breast. Again the whole of the chest and neck was covered with the rash. On the 27th serum was given twice, and on the following day three times, when the temperature came down to 97·8°, serum being given once daily and for the last time on the 30th. The patient then made a slow but satisfactory recovery, and is now quite well.

The points of interest in this case are the evident absorption of septic matter from a mastitis without any evident collection of pus; the prompt and satisfactory action of the serum after quinine had been given without good effect; and, finally, the recurrence of the symptoms in a few days after the serum had been stopped, and the controlling power of the serum when again resorted to. This leads me to think that in similar cases it would be well to continue the administration of serum for some time after all symptoms had subsided, if even in smaller or less frequent doses.

Lymington, Hants

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### MEDICAL AND SURGICAL SECTIONS.

*Duodenal Ulcer.*

COMBINED meetings of these sections were held on Dec. 14th, 1909, and Jan. 11th, Mr. G. H. MAKINS being in the chair.

Mr. B. G. A. MOYNIHAN delivered the opening address on Duodenal Ulcer, which was printed in THE LANCET of Jan. 1st, p. 20.

Mr. H. COLLINSON read a paper on the Analysis of 197 Cases of Duodenal Ulcer operated upon by Mr. Moynihan (1900–1908).

Sir T. LAUDER BRUNTON said that with regard to the season it had been his experience that gastric and duodenal ulcer—he could not distinguish them in his list of cases—was much more common in two periods of the year. He had not noticed it so much in mid-winter, but much more in autumn and spring. And the reason which he had assigned to himself was that people put off too long their winter clothing and so were chilled in autumn, and they put off their winter clothes too early in the spring, and in each case a chill was liable to result. Many years ago, when he was working at the physiology of the subject for Burdon Sanderson's "Hand-book for the Physiological Laboratory," he made very many experiments upon the stomach and upon the intestine. He tried, and in vain, to make gastric ulcers. He put a ligature round a small portion of the mucous membrane of the stomach which he had previously opened, and then closed the wound, keeping the animal under narcosis, and allowed it to remain four or five hours. He thought that at the end of that time an ulcer would be found at the spot where the blood-supply had been stopped by the ligature. But in none of the cases was he successful. Mr. Moynihan had left out reference to one part which he (Sir Lauder Brunton) would like to supplement—namely, the cause of the pain. The pain came on between two and four hours after the stomach had commenced to discharge its acid contents. Those acid contents came over the duodenum and smarted the ulcer, causing intense pain by the acid acting on the bare surface. This pain could be relieved by not putting anything into the stomach which causes a reflex contraction of the pylorus, the acid juice from the stomach was thus prevented from flowing into the duodenum, and any acid which was already there was quickly neutralised by the alkaline juice of the duodenum itself, possibly partly by some of the bile. That might be imitated by giving bicarbonate of soda in large doses. Time was a very important factor in the diagnosis, as Mr. Moynihan had said. Sometimes one might be misled as to the nature of the lesion, and yet be right as to its position. In one case which was brought to him the symptoms were pain four hours after feeding, and he thought there must be something wrong in the duodenum, but it did not yield in the ordinary way to the administration of alkalies, and he said he was doubtful as to whether it was ulcer or not, but he thought it must be something wrong with the duodenum. He never saw the case again. Eighteen months afterwards there was a description in THE LANCET of an operation on that patient. From that it turned out that he was right as to the position of the lesion, but it was a kink and not an ulcer. Time had also been very valuable to him in diagnosing duodenal ulcer when the diagnosis for a time would have been very doubtful. As an example he might mention that he was once asked to see a patient who was suffering from severe lumbago. On examination he found that the so-called lumbago was limited to the right loin; it did not extend round the back. It came on between two and three hours after a meal and was again stopped by food. He (Sir Lauder Brunton) concluded that it was a duodenal ulcer, and told the doctor that it could be perfectly well ascertained whether it was duodenal ulcer or not by giving a large quantity of bicarbonate of soda, and if it was duodenal ulcer, by neutralising the acid of the gastric contents one would stop the pain. The doctor tried it and the pain ceased immediately, so that there was some doubt as to the

diagnosis. Two or three days afterwards the doctor told him that the patient had passed a large quantity of blood by stool. Then he (Sir Lauder Brunton) found that the patient had been allowed to get up, and he instructed that he should be kept in bed, and he also added something to the medicine, bicarbonate of soda, as it occurred to him that a large quantity of bicarbonate of soda would tend to make the surface of the ulcer softer. And to counteract that it would be better to put him on carbonate of lime, which would act as an astringent. But the difficulty about that was that it tended to cause constipation, and therefore some carbonate of magnesium was added. It was an exceedingly useful combination for duodenal ulcer, and he counselled that it should always be given in such cases, in addition to paying attention to the history of the case. He never advised operation unless he found by using mixed carbonates the pain was at once relieved by them. In one case which he saw he tried that plan; he was not successful, and he wondered at it. But the history of the case seemed to point so clearly to gastric or duodenal ulcer that he thought it must be ulcer. In that case, as Mr. Moynihan had mentioned, the pain was not on the right side but was rather under the left ribs, and that further misled him. He put the patient to bed in the ordinary way and kept her on rectal feeding for three or four days, and then gave her a very limited diet. At the end of that time she began to improve, but still she had occasional recurrent pain. That patient had suffered for about a couple of years or more from regularly recurring attacks of pain, coming on about four hours after a meal, lasting for a short time and then disappearing. She had never had a sign of jaundice; there was no tenderness over the liver. After being in the hospital for a time she had what seemed to be a perforation, she became suddenly comatose and lay on the bed perfectly still. In all cases of gall-stones he had seen the patient had been writhing and moving about with agony, but in this case there was nothing of that sort. He asked a surgical colleague to see her and he said she could not be operated upon then as she was collapsed and would die from the operation—they must wait until she recovered. She did recover from the attack, and at the operation it was found there was no ulcer in either duodenum or stomach, but there were between 200 and 300 minute gall-stones of the size of a millet seed, and each of those had been sufficient to pass through the cystic duct without blocking the common bile-duct. She had so many of them that she was able to provide a small gall-stone for every meal for about two years before, and she had enough left there to serve for a meal each for 100 more days. That case showed that the diagnosis of duodenal ulcer from gall-stones was not always easy, and the two points he wished to lay stress on were first of all the necessity of keeping the surface warm in order to prevent the occurrence of either gastric or duodenal ulcer; and secondly, the use of mixed carbonates in large doses as a means of diagnosis. It was desirable to mention also that those mixed carbonates were a means of relieving the patients who did not wish to have an operation, and if combined with careful dieting and rest in bed with warmth to the surface he thought one might sometimes obtain cure without recourse to operative measures. But he was fully agreed that where the ulcer was obstinate and did not yield to such measures the surgeon must be asked to interfere.

Mr. FREDERIC S. EVE said that he wished first to congratulate Mr. Moynihan on the excellent results which he had tabulated. Although he agreed that as a rule the symptoms of duodenal ulcer were definite, yet there were certain important exceptions to that. The conjunction of symptoms of pain two or three hours after a meal, together with hunger pains, did not necessarily mean, in his opinion, that the patient had duodenal ulcer. He was convinced that a patient might have all the symptoms which Mr. Moynihan had described as those of duodenal ulcer and yet be suffering from a simple functional disorder of the stomach, whether it were called hyperchlorhydria or not. Until recently he had always found a duodenal ulcer at the operation when it had been suspected from the symptoms. But a fortnight ago he operated upon a patient possessing all the symptoms which had been described but in which no ulcer was present. It was such a striking case that he would briefly quote it. The patient was a man aged 30 years. He had suffered from frequent periodic attacks of abdominal pain for nine years altogether. A year before he had an attack which lasted something like six months. His present attack commenced 12 weeks before admission to hospital. He complained of pain in the epigastrium, coming on two or three hours after a meal. He often awoke at night with an attack of pain which was relieved by taking warm milk. He questioned the sister and nurse as to this, and, in his opinion, the patient had quite definite "hunger pain." He operated upon him but could find by palpation nothing in the duodenum. One of his colleagues who was assisting him pointed to a slight thickening and wrinkling of the peritoneum which he thought suggested an ulcer on the anterior surface, but he (Mr. Eve) could not find any thickening beneath it. He made an opening in the anterior wall of the stomach near the pylorus and passed his finger through the duodenum, but could find nothing. He therefore ungloved his hand and passed his bare finger in, and his colleague did the same. He also examined the interior of the stomach. There was no ulcer of either stomach or duodenum. This patient, therefore, had all the symptoms upon which Mr. Moynihan laid so much stress: marked periodicity of attacks and "hunger pain," &c., and yet no duodenal ulcer was present. Two days after that he met with another case, that of a man who had had precisely similar symptoms, and it was thought by several good observers that he had duodenal ulcer. In that case also there was no ulcer of the duodenum, but an ulcer on the lesser curvature two inches from the cardiac orifice of the stomach. There was no doubt that the diagnosis of duodenal ulcer was often beset with difficulties. In a patient who died in the London Hospital from perforation there was only pain for one week before his death. And yet he had a chronic ulcer on the anterior and posterior surfaces of the duodenum. He agreed with Mr. Moynihan in regard to the frequency of multiple ulceration of the duodenum. In the years 1907–08 there were 22 post-mortem examinations in cases of death from duodenal ulcer in the London Hospital. Twenty-one of them died from perforation and one from hæmorrhage. In one-third of those cases there were contact ulcers—i.e., ulcers on opposing surfaces of the duodenum—and in five of the 22 there were ulcers both in the duodenum and stomach. He fully concurred in the opinion expressed that an operation should not be delayed in any case of suspected duodenal ulcer. If the symptoms did not yield to medical treatment, or if a second attack occurred, he thought an exploratory operation should be done. His experience of gastro-enterostomy had been satisfactory, but one of his cases died 40 days after the operation, and after leaving the hospital, from uncontrollable melæna, which no doubt came from the ulcer. Therefore he did not consider that gastro-enterostomy was necessarily a curative procedure. He therefore advocated not only gastro-enterostomy but also narrowing of the pyloric orifice by a series of gathering sutures in order to prevent later closure of the opening made by the gastro-enterostomy. He fully concurred in the wisdom of Mr. Moynihan's advice—namely, that if the ulcer was situated on the anterior or outer surface of the duodenum in an accessible position it should be in-folded, but he could not agree with him as to the necessity of excising the ulcer. Mr. Moynihan had himself pointed out that ulcers of the duodenum were frequently multiple. If one proceeded to excise an ulcer on the anterior surface of the duodenum it was very likely there would also be one on the posterior surface, and that would lead to a complete resection of the duodenum, a proceeding which would be by no means free from danger. He wished to ask Mr. Moynihan whether, since he had adopted excision of the ulcer, he had associated it with gastro-enterostomy. If he did not he (Mr. Eve) thought there was a good chance of the symptoms recurring. Mr. Moynihan had not told the meeting what signs he relied upon to establish the fact that there was an ulcer of the duodenum. He could not agree with that gentleman that it was the invariable experience that the ulcer was plainly seen and demonstrable on opening the abdomen. In two instances which he could remember he had found it necessary to open the stomach by an incision and to insert his finger into the duodenum. In one of these cases (the man who died subsequently with hæmorrhage) he observed a thickening of the head of the pancreas which could not be distinguished from a chronic indurative pancreatitis. The duodenum was adherent to the pancreas in that region, but he had noticed

in severe cases of chronic indurative pancreatitis that such a condition was not uncommon. He passed his finger through the pylorus and found a very deep ulcer on the inner surface of the duodenum, which penetrated the pancreas deeply. It was not large in diameter but just admitted the tip of his index finger. In the other case the patient presented all the symptoms of gastric ulcer and had hæmatemesis. On examination of the outside of the stomach he found no evidence of gastric ulcer, and therefore he explored its interior. On passing his finger through the pylorus he came upon a duodenal ulcer, but there was no ulcer of the stomach. He thought far too much stress was often laid on superficial cicatrices in the peritoneum as establishing the existence of gastric or duodenal ulcers. In the case which he had quoted, in which duodenal ulcer was absent, there were changes in the peritoneum which might easily have been mistaken for thickening over an ulcer; and he had noticed on the surface of the stomach thickenings and yet had found that no ulcer was present beneath them. He would urge on his surgical colleagues, for the sake of scientific accuracy and to guard against the possibility of error, that the examination of the interior of the stomach by incision should be much more frequently carried out; and he believed that method had thrown considerable light on the pathology of gastric conditions. For instance, in 29 consecutive cases diagnosed by able authorities as gastric ulcer he opened the stomach itself 21 times, and in 12 out of those 21 no ulcer was present. The symptoms were either due to gastrotaxis or some allied condition. He therefore wished to urge the importance of that method of examination. If carried out carefully it did not increase the mortality, for in not one of those 21 cases did the patient succumb. Although he differed from Mr. Moynihan in some details he was nevertheless an admirer of his work.

Dr. W. HALE WHITE said he thought one thing which must interest many members present was not so much the part of the subject which had been dealt with that evening as that of the likelihood of medical men coming across those cases, whether they were very numerous, and how likely they were to be met with. Therefore he made out a few figures dealing with that point. The classical series of cases at Guy's Hospital compiled by Perry and Shaw showed that out of 17,000 post-mortem examinations there were only 70 cases of duodenal ulcer. That carried them down to 1892. But in the 3,800 post-mortem examinations for the last seven years there were 38 cases, so that showed apparently an enormous increase in the number of duodenal ulcers found. But on looking into the cases the reason for that increase was as follows: that now the medical profession generally recognised that the patients' only chance when perforation of gastric or duodenal ulcer occurred was to send them into hospital as quickly as possible, whereas in the olden days the trouble was not even taken to send them to the hospital—they were regarded as necessarily fatal. Looking at the matter again from the statistical point of view, in the last 12,000 medical cases admitted duodenal ulcer was diagnosed 33 times. But taking 1000 cases seen outside the hospital, duodenal ulcer was diagnosed 24 times. That seemed at first sight to give a very much larger number of duodenal ulcers among people seen outside the hospital than of people seen inside it. But there again the fallacies were many, because on looking into the cases one saw that of the 33 in the hospital 17 were fatal, again many perforative cases. And of the 24 outside the hospital only one was fatal, and that was fatal on account of hæmorrhage. He thought those figures showed the small number of in-patients compared with the number seen outside the hospital, and that there must be a great many people suffering from duodenal ulcer whose symptoms were not considered sufficiently severe to secure their admission to hospital. And as the subjects of the condition outside the hospital lived near the hospital and would come into the hospital for serious complications, it must be concluded that for a large number of people with duodenal ulcer hospital out-patient treatment sufficed. And with regard to cases seen outside the hospital, it must be remembered that in every one of those cases the patient was bad enough to require that there should be a second opinion on the case. So the supposed greater frequency of duodenal ulcer compared with 20 years ago was due to greater medical knowledge, which no one had contributed to so much as the work of Mr. Moynihan in this country and the Mayo brothers in America. With regard to the symptoms, he had thought over what appeared to him to be a picture of the pain of duodenal ulcer. But he would not weary the meeting with it, because it came to what Mr. Moynihan had said, and he did not think he could in any way improve upon Mr. Moynihan's description of the pain coming on at a definite interval after food, and the strange part which misled many people was the periodicity of the pain. The patients would go for months without pain, and everyone knew people who could go out to dinner for two or three nights a week for months and have no symptoms, but occasionally would have an attack so bad as to cause them to writhe on the floor in consequence of it. He had seen a man writhing on the floor in such an attack, and the cause of it was proved by operation to have been duodenal ulcer. One thing which he was accustomed to lay much stress on was local tenderness in the region of the duodenum, and a great help in diagnosis in those cases was a slight rigidity of the right rectus, compared with the left. It was that local tenderness which led to the great difficulty in diagnosis, for he agreed with Mr. Moynihan that the diagnosis of duodenal ulcer was not difficult. Of recent cases when surgical operation was done—in very many cases it was—the diagnosis was found to be correct in every case. It was difficult sometimes to tell whether a patient was suffering from duodenal ulcer or from gall-stones, not when they were passing gall-stones but when they were suffering from the pain which was due to gall-stone lying in the gall-bladder, too large a stone to pass down. He would have mentioned, if there had been time, a case in which there was confidently thought to be duodenal ulcer. As far as one could see from outside, the duodenum was healthy, but the patient had a large stone in the gall-bladder, which was removed, and the pain had ceased. It was possible that owing to the close contiguity of the gall-bladder and the duodenum to each other the symptoms were due to some trouble in the duodenum proceeding from the gall-bladder. That seemed to him to be the greatest difficulty in diagnosis in many of those cases. He had come across one or two interesting complications which had not occurred in Mr. Moynihan's descriptions. One patient was suffering from considerable parotitis, and in the last three months he had seen two subphrenic abscess cases in connexion with duodenal ulcer, and one of them yielded nearly two pints of pus, and it very well illustrated a point which was of help in diagnosis. A subphrenic abscess due to duodenal ulcer must almost necessarily be to the right of the suspensory ligament, and most subphrenic abscesses to the right of that ligament were due either to duodenal ulcer or to appendix trouble. But he thought the appendix ones practically never contained air, but the duodenal ulcer cases might. In that particular case, because the abscess cavity contained air they settled it was duodenal ulcer, and that turned out to be correct. Another interesting complication which he had come across was that once in a bad case of hæmorrhage one could feel a blood-clot in the duodenum. Hæmorrhage came on while she was lying in hospital and it was fatal. So the abdomen had been examined, and directly after the hæmorrhage a sausage-like tumour could be felt which gradually disappeared. Then the patient had another attack of hæmorrhage, from which she died. An ulcer was found at the post-mortem examination. Mr. Moynihan had carefully said that the operation was to be done for chronic duodenal ulcer. That, of course, naturally supposed there must be a stage during the patient's illness during which he or she should be allowed the benefit of other treatment to give the patient the chance of getting well. The more or less routine treatment which he had adopted had been to put the patient rigidly to bed, and she was fed on a mixture of egg and milk, half a pint of milk with an egg beaten up in it, and a teaspoonful of that at a time every half hour. The quantity was increased until the patient was taking two or three pints a day. In order to get into the patient large quantities of fat, which were so useful, cream might be added to the egg and milk or olive oil might be given, which in addition to being more fatty was slightly aperient, for these patients were often constipated. After a month or so of that treatment they could be given meat and chicken chopped up. But if after that treatment the pains continued he certainly thought the case ought to be handed over to a surgeon for operation. For one severe or two or

three less severe hæmorrhages it was probably wise to do a short-circuiting operation even without waiting for medical treatment, for there were many fatalities from hæmorrhage due to duodenal ulcer. He had intended to ask Mr. Moynihan whether it was not an objection to excising an ulcer that the ulcers might be multiple, and therefore one or more of them might be left behind after the operation.

Mr. H. F. WATERHOUSE said he was glad to find himself in almost complete agreement with Mr. Moynihan, and that was not astonishing, for English surgeons had learnt most about the subject from Mr. Moynihan. One point which struck him exceedingly in duodenal as compared with gastric ulcer was the comparative frequency of the two in hospital as compared with private practice. In hospital practice he had had a vastly larger number of gastric ulcers, whereas in private patients the duodenal ulcers preponderated. In private practice he had had three or four duodenal ulcers to one of gastric. He took it that that was largely accounted for by the frequency with which gastric ulcer occurred in young anæmic servant girls. Duodenal ulcer which he had met with on the operating table had proved to be indurated and chronic and always easily felt and demonstrable. He thought Mr. Moynihan had done good service by pointing out that an ulcer which could not be felt—he would not go so far as to say which could not be demonstrated to the people in the operating theatre—was not properly a duodenal ulcer. Practically every duodenal ulcer which he had had, had been palpable. As to age, his statistics were in striking agreement with Mr. Moynihan's. They were commenced between 30 and 45; probably nine-tenths of the cases occurred in that age-period. But duodenal ulcer was not unknown in childhood. He had had one definite duodenal ulcer in a child under a year old, and another one in a child under 5 years of age. He thought the possibility of duodenal ulcer occurring in childhood had been overlooked by most writers on the subject. He was convinced it was not a very rare condition. Again, as regards multiplicity, he thought Mr. Moynihan had done useful service in pointing out that duodenal ulcers were frequently multiple. He had never felt more than four or five on the operating table. That possibility of multiplicity of ulcers should be a direct bar to any such operation as excision. In the treatment of such ulcers he used only, and should continue to use only, gastro-enterostomy. In spite of what Mr. Moynihan had said, he regarded excision of the ulcer as dangerous, and it must have a greater mortality than such an operation as gastro-enterostomy, in which, in careful hands, the mortality from the operation was practically *nil*. He would like one result of the present debate to be a general agreement, that excision of duodenal ulcers was to be a thing of the past and that every case of the kind was treated satisfactorily and sufficiently by means of gastro-enterostomy. He would like to refer to the frequency with which he had found gastric and duodenal ulcers in combination. It had been something like 1 in 4, and that led him to speak of the difficulty of diagnosis. Mr. Moynihan and Dr. Hale White said the diagnosis of these ulcers was not usually difficult. It might not be to those gentlemen, but he was afraid that to the ordinary man like himself the diagnosis of that condition had not infrequently been a matter of some considerable difficulty, and his difficulty had been in differentiating between gastric and duodenal ulcer, and where that difficulty had arisen there had generally been found to be both gastric and duodenal ulcer coexisting. Therefore he did not wish it to be understood that all members agreed as to the ease with which the diagnosis could be made. He had known the best physicians and surgeons make mistakes in the diagnosis between those two conditions, and also between duodenal ulcer and gall-stones. He had seen three or four cases of duodenal ulcer in which the pain radiated extraordinarily. It was not usually the case in duodenal ulcer, but was general in gall-stones. Where the duodenal ulcer caused such pain that the patient writhed on the floor it was very difficult to know whether it was a case of gall-stones or not. He was in agreement with Dr. Hale White with regard to tenderness: he regarded tenderness and a slight rigidity of the right rectus muscle compared with the left as valuable signs in diagnosis. He also agreed with the opener as to hyperacidity. In all the cases which he had had examined free hydrochloric acid had been found to be under the normal. A point in the diagnosis was melæna: That had been present in the majority of cases of the condition with which he had had to deal. And where no melæna had been obvious to the naked eye blood was found in the stools by microscopical examination. It was a cause of gratification to surgeons to known that the distinguished physicians themselves who had taken part in the discussion recognised fully that when medical treatment had failed it should not be prolonged to any great extent, but the case should be handed over to the surgeon before any harmful results, such as stenosis, had had time to develop. With regard to treatment, he considered that the one and only treatment was gastro-enterostomy, and as far as his experience went that was all-sufficient and satisfactory. He knew no operation which gave greater relief for any condition than gastro-enterostomy did for the condition of duodenal ulcer.

Dr. R. HUTCHISON said that a superficial study of Mr. Moynihan's writings would give the impression that "hunger pain" was a pathognomonic sign of duodenal ulcer. Similar pain, however, was noticed in certain cases of gall-stones and in certain cases of chronic appendicitis. What concerned the physicians, however, was whether a condition not organic at all but functional could manifest itself by the presence of a pain in the late period of digestion. Dr. Hutchison believed that there was such a functional condition and to it was applied the term "hyperchlorhydria." Patients suffering from excess of acidity complained of a pain to which the term hunger pain could not be denied and which was relieved by taking alcohol or partaking of food. Mr. Moynihan would probably reply that these cases not only suffer from hyperchlorhydria but also from duodenal ulcer. The point at issue was whether it was possible to have hunger pain from hyperchlorhydria apart altogether from duodenal ulceration. Dr. Hutchison believed that post-mortem evidence proved the absence of organic lesions in certain cases where hunger pain had been present. Operative evidence also bore out this view. He thought it advisable to operate in suitable cases for duodenal ulcer and further contended that after these cases had been operated on the patient should be kept under medical treatment for some considerable time. There was a tendency for the surgeon to think that the patient might on recovery from the operation go straight away and eat, drink, and be merry. He had known of patients who had done this with disastrous results. He considered that operation was not the end of treatment of these cases.

Dr. A. F. HERTZ was convinced that the old teaching based on pathological observations must be rejected and that Mr. Moynihan's conclusions as to the frequency in the symptoms of duodenal ulcer must be accepted with certain reservations. There was no doubt that the presence of free hydrochloric acid played an important part in the production of the pain of duodenal ulcer, as the pain was immediately relieved by alkalies and by the removal of the acid fluid present in the stomach. He could not agree with Sir Lauder Brunton that the hydrochloric acid itself was the direct cause of pain, as he (Dr. Hertz) had found that several ounces of 0·5 per cent. hydrochloric acid produced no pain when introduced by a tube into the empty stomach of a patient in whom an operation performed the same or the following day revealed the presence of an active gastric or duodenal ulcer. He did not consider that an operation should be recommended in the absence of obstruction until thorough treatment by diet and rest in bed for at least four weeks had failed to give relief or until frequent recurrences had occurred in spite of every precaution.

Mr. H. J. PATERSON said he had not found that the symptoms were anything like so typical as Mr. Moynihan had described. In 41 cases in which he had performed operation he was surprised to find what differences there were in regard to what the patients said about their pain; some said it was immediately after food, some said it was continuous, and a small number complained of hunger pain. He pointed out the advisability of finding out the means of diagnosing duodenal ulcer from gastric crises.

Dr. NATHAN RAW discussed the question of the frequency of duodenal ulcer, and said that in Liverpool the cases were not so many as had been reported at Leeds. He related details of a case in which the patient suffered from hunger pain, and in which it was found that there was a chronic thickening of the pylorus, but there was no ulceration present.

Dr. F. CRAVEN MOORE said he held a brief for acid dyspepsia and declared that hyperchlorhydria was a term based on a misconception of physiology and did not exist. Acid dyspepsia was associated with excessive secretion of normal gastric juice. This condition gave symptoms of hunger pain as met with in duodenal ulcer. He did not agree with the view that hunger pain had the profound diagnostic significance ascribed to it.

Mr. C. P. CHILDE described three cases of perforating duodenal ulcer which had occurred in his practice, the perforation being the first indication of the condition. In these cases he considered that gastro-enterostomy was the only feasible treatment.

Mr. MOYNIHAN, in concluding the debate, said that it was now a matter of general agreement that the symptoms which he had described were dependent for their presence upon a structural lesion, ulcer of the duodenum. They were at last escaping from the bondage of the vocabulary and were ceasing to apply incorrect and misleading terms, such as "acid dyspepsia" and the like, to an organic disease. The practitioners who were still submissive to the tyranny of the ancient text-books often quoted these authorities as being opposed to his opinions. It was true that these works contained no recognition of the facts that duodenal ulcer was a common disease, marked out by the plainest symptoms and admitting of easy diagnosis. Recent authors, however, were adapting their views to the wider knowledge with which the surgeon had lately equiped them. Precise inquiry into all the details of the anamnesis prevented a majority of the mistakes in diagnosis to which reference had been made. One of the difficulties confronting an author to-day was the desire of many readers for the most concentrated epitome of his message. The torrent of Niagara must be described in terms of the pipette. So "hunger pain," a term which had been debased and shorn of all the attributes with which he had clothed it, was held to indicate undoubtedly the presence of a duodenal ulcer. All the varied qualities of this important symptom, however, required consideration before a diagnosis based upon it could have any substantial value. We were entitled to say that by a careful study of the anamnesis, and from that alone, the diagnosis of duodenal ulcer could now be made with a degree of accuracy not exceeded in the case of any other abdominal disease. The physical signs were few, and of no real value in enabling a diagnosis to be made. Tenderness, muscular rigidity, and increased epigastric reflex on the right side might one or all be present, and if present were better marked during the time that pain was present. The only difficulties of diagnosis were concerned with the differentiation of duodenal ulcer from gastric ulcer, from gall-stones, and from appendicitis. If an ulcer were not found on palpation and inspection of the stomach or duodenum, inspection of the mucosa was useless. He held very confidently to the opinion that an ulcer which had been the cause of protracted and recurring symptoms had always reached the outer coats of the stomach or duodenum; it was never restricted to the mucosa. Instead of the unnecessary search within the stomach, the gall-bladder and appendix should be examined. The condition of "appendix dyspepsia" was important and as yet not generally recognised. If an operation were undertaken for the relief of long-standing symptoms believed to be due to a duodenal or gastric ulcer, and no ulcer were discovered, it was absolutely necessary that the appendix should be examined; in a notable proportion of such cases it would be found adherent and obstructed and its removal would be followed by a disappearance of all symptoms. It was quite inadmissible in such cases to perform gastro-enterostomy. The different views in respect of treatment, held by physicians and surgeons, would probably disappear as it became more widely recognised that the symptoms pointed to an organic and not to a functional disorder. If medical treatment in early attacks proved powerless to prevent recurrence, then surgical treatment would admittedly be necessary. If the ulcer were small and single, excision would cure the patient; if the ulcers were large or multiple, as was generally the case, gastro-enterostomy would be necessary. Many of the early unsatisfactory results of gastro-enterostomy were due to the wrongful application of this operation, the precise indications for which were now fully understood. After the operation the patients required supervision for some time.

## MEDICAL SOCIETY OF LONDON.

*Exhibition of Pathological Specimens.*

A MEETING of this society was held on Jan. 10th, Dr. SAMUEL WEST being in the chair.

Dr. F. PARKES WEBER showed a Heart from a case of Chronic Malignant Endocarditis Simulating Splenic Anæmia. He said that the patient had visited South Africa several times and had often been in the Mediterranean and the surrounding countries. He contracted malaria when in the Straits Settlements about four years ago, and had had two slight recurrences since then. He had been treated at several London hospitals, where apparently the diagnosis of splenic anæmia was made. The spleen was much enlarged, its lower limit reaching a level of half-way between the umbilicus and pubes. There was a very decided leucopenia. The heart was large, weighing 21 ounces, and the left ventricle was hypertrophied. The cardiac musculature was very pale. There was old thickening of the mitral valve, and adherent to one part of the valve was a soft organised thrombus of about the size of a hazel nut. In the left auricle, and apparently growing from the inter-auricular septum, was a large polypoid excrescence, which measured about 70 millimetres in length and about 35 millimetres in breadth. It was attached by a short circular pedicle about 7 millimetres in diameter to a spot in the inter-auricular septum, about halfway between the thrombus on the mitral valve and the (closed) foramen ovale. The free end of this polypoid excrescence, which was evidently an old organised thrombus, was opaque, white, and hard, its surface feeling as if it were partially calcified. The decided leucopenia and chronic splenomegaly in the case seemed to point to a diagnosis of splenic anæmia or Banti's disease, but the post-mortem examination showed that the fatal illness was really a chronic form of malignant endocarditis. It had been abundantly proved that leucopenia was not pathognomonic of splenic anæmia, if splenic anæmia could be supposed to exist at all as a distinct disease.—Dr. F. DE HAVILLAND HALL said that in doubtful cases of so-called splenic anæmia some scepticism was warranted, and the possibilities must be considered of the cause being ulcerative endocarditis.—Dr. J. PORTER PARKINSON said he had had a case of the kind under his care, in which during life there was a constant leucopenia not to the same extent as in Dr. Parkes Weber's case, but it was quite a distinct condition. The necropsy revealed the presence of malignant endocarditis.—After Sir JOHN BROADBENT had narrated a case which was marked by intermissions, Dr. WEST said that it was not easy to decide what was meant by the term splenic anæmia. In regard to its relation to malignant endocarditis the difficulty occurred of rightly appreciating the sequence of events. It was possible that malignant endocarditis might be secondary.

Various pathological specimens were shown by Dr. LEONARD GUTHRIE, Dr. W. D'ESTE EMERY, Dr. F. LANGMEAD, Dr. B. H. SPILSBURY, Dr. ERNEST H. SHAW, and Mr. ARTHUR EDMUNDS.

Mr. A. FLEMING demonstrated the Serum Diagnosis of Syphilis by a Simple Modification of Wassermann's Method.

The new Leitz epidiascope recently purchased by the society was used for the first time at this meeting.

## THE RÖNTGEN SOCIETY.

*Radio-Activity and Animal Tissues.*[1]

A MEETING of this society was held on Jan. 6th, Mr. C. E. S. PHILLIPS being in the chair.

Dr. W. S. LAZARUS-BARLOW, in the course of a paper on Radio-Activity and Animal Tissues, described experiments dealing in part with recognised radio-active substances and in part with animal tissues, with extracts of animal tissues, and with animal cells. He pointed out relationships between these classes in respect of their effects upon photographic plates, upon the leak of a charged electroscope, and upon the development of living animal cells. Dr. Lazarus-Barlow

[1] See the Croonian Lectures on Radio-Activity and Carcinoma, by W. S. Lazarus-Barlow, M.D. Cantab., F.R.C.P. Lond. (THE LANCET, 1909, vol. i., p. 1801).

first gave details of experiments which enable the "skotographic" effects of tissues to be contrasted to some degree with the effects produced by recognised radio-active substances upon a photographic plate and then discussed the effects of the same substances upon electroscopic leak. In a certain number of cases, notably cancer material, which had been extracted with water and subsequently with ether, or had been extracted once and for all with acetone, the inorganic constituents of bone, and clay pipes, presence of the substance within the electroscope led to a more rapid leak of the electroscope than in their absence, and this whether the charge on the gold leaves was + or −. These substances, therefore, satisfied the physicist that they were "radio-active" in the physico-chemical sense of the term, and from the electrical side. It must be added, however, that each substance, and each of the numerous samples of each substance, was entirely without effect upon a photographic plate. On the other hand, he had met with a considerable number of substances which retarded electroscopic leak. The most striking of these were paraffin wax, cholesterin, gall-stone, liver substance (dried and powdered), and the watery, ethereal, or acetone extract of cancer tissue and of liver tissue. That retarding property on electroscopic leak was manifested whether the charge on the gold leaves was + or −. He considered that there was evidence that the retardation of the leak possessed a real significance, since he had found in the case of cancerous material that from a substance almost without effect upon leak it was possible to obtain a moiety which accelerated the normal leak and a moiety which retarded it. Summing up that portion of the research which dealt with the electrical effects it was clear that in certain cases the influence of animal substances upon electroscopic leak was identical with that exerted by recognised radio-active substances, differing only in the much smaller degree to which the animal substances accelerate the leak. He contended, however, as the result of his experiments upon the influence of an aluminium disc which had been kept in proximity to a recognised radio-active substance, that those animal and other substances which he had found to retard electroscopic leak, whether the charge on the gold leaves were + or −, had a no less close relationship to radio-activity than those which accelerated leak. But whether the term "radio-activity" would have to be extended to include retardation of electroscopic leak as well as acceleration or not, there was no doubt that the conditions under which a recognised radio-active substance was called upon to act had a profound influence upon its demonstrable electrical effect. That was a point of great importance when they considered that in the animal body no chemical substance acted in the form in which it was commonly known to chemists but always in one or other protein combination. That the iron of the blood was present in a form in which it did not yield the ordinary inorganic chemical tests but existed as an iron-globulin compound was probably nothing more than an example of a general truth. As the disappearance of the chlorides from the urine during the early days of an attack of lobar pneumonia seemed to indicate, even so universal and simple a substance as sodium chloride existed in the body in the form of a loose protein compound. Hence one could not assume that a radio-active substance, if present in the animal body, would be present in the form in which it was known to chemists and physicists, but would be modified in some way by its association with the protein molecule. On consideration it would be seen that the radio-activity manifested by a uranium compound, for example, and measured by the rate of leak which it induced in a charged electroscope, indicated only the surplus energy available after the internal electrical conditions of the molecule, whatever they might be, had been satisfied. That this was so was indicated by the fact that the more numerous, the heavier, and the greater the valency of the non-radio-active constituents of a radio-active compound, the less of that surplus energy remained available, the less did the compound accelerate electroscopic leak. In other words, in every compound of a radio-active element some portion of the total intrinsic radio-activity was bound or masked. In a long series of experiments published elsewhere Dr. H. A. Colwell and he had shown that that was the case. Here he would only recall one of them. If a uranium albuminate be made by dropping a solution of uranium nitrate into egg-white, collecting the precipitate, drying and pounding it, a pale yellow powder was obtained which yielded nearly 10 per cent. uranium on analysis. If then a small portion of that powder were spread evenly on a shallow platinum dish and placed within the electroscope the natural leak would show a certain acceleration. If, subsequently, the platinum dish with its contents were raised to a white heat the albuminous portion of the radio-active compound was completely dissipated into carbon dioxide and water, while the uranium portion remained in the platinum dish. On re-introducing the dish into the electroscope it would be found that the acceleration of natural leak had enormously increased. Obviously the amount of the radio-active substance and its area of exposure to the charged leaves had remained the same, but removal of the huge molecule had unmasked a considerable amount of the intrinsic radio-activity. He suggested that that experiment might not be without therapeutic promise. If it was possible to set free radio-activity from a radio-active compound by breaking it down from a highly complicated molecule to simpler ones, a means might become available for local application of radio-activity within the tissues of the body. Thus he had found that in the process of breaking down the complex uranium albuminate into the simpler uranium peptonate by ordinary processes of artificial digestion radio-activity became unmasked. One could conceive the possibility of determining that such a change shall take place at some given spot. The last experiments to which he wished to draw attention were of a different kind. Hitherto in the contrast he had tried to make between radio-active and animal substances the "test" material had been inanimate—a photographic plate or a charged electroscope; in those about to be described the "test" material was a living animal cell—namely, the fertilised ovum of ascaris megalocephala, an intestinal worm of the horse. If X rays, or radium, or thorium, or uranium were allowed to act upon a sample of these ova their normal rate of development was altered, and in the case of X rays and radium modified to a profound extent. It was impossible to enter into a minute description of the changes produced, but it might be said that in the case of all those radio-active substances the effect was the same, and dual. It consisted in two antagonistic influences, one of which accelerated the rate of development of the ova, while the other retarded it. It had not hitherto been found possible to separate those two effects, for they seemed to show themselves in different individuals side by side. The most that could be said was that short exposures seemed to accelerate, long exposures to retard, development. Nevertheless, every instance in which retarded development of the ova was greatly prodominant showed examples in which the sole recognisable result of exposure to the radio-active substance was accelerated development. If a similar preparation of ova were placed in near proximity to, but not in contact with, certain animal extracts, similar modifications of the rates of their development were observed. But instead of acceleration and retardation showing themselves side by side in the same sample of ova they were discrete. Thus a protein-free extract of the testis of the herring accelerated, while a similarly prepared protein-free extract of the ovary of the herring or of sheep's liver retarded, the rate of development. There was strong reason to believe, further, that the results in question were not chemical. It did not seem improbable that the influence exerted by the animal extracts upon the dividing animal cells was closely akin to, if not identical with, that exerted by recognised radio-active substances. If that be conceded it must be added that the animal extracts in question possessed strong skotographic powers, and unless they differed completely from all the other animal extracts he had examined they also retarded electroscopic leak.

Dr. S. RUSS commented upon the difficulty of accepting the experimental effects which had been termed "anti-radio-active." The ordinarily accepted view was that the natural leak of an electroscope corresponded to the production of ions in the air contained within the instrument, and that this action was increased by the presence of radio-active substances. The difficulty was to explain how other substances could cause a diminution in the number of ions. Dr. Russ next remarked upon the experiments in which an aluminium disc, previously exposed to radio-active substances, had caused a diminution in the natural leak of an electroscope when placed inside it. Although control experiments had been done by Dr. Lazarus-Barlow, it was difficult to avoid changes in the

capacity of the instrument when introducing into it a conductor, such as the aluminium disc. If the capacity were increased there would be a corresponding diminution in the natural leak. With regard to the changes which had been observed in the activity of uranium and thorium when associated with the molecules of different substances, it was suggested that in a comparison of this sort the difficulty would be to secure that the same surface density of the radio-active substance was being dealt with in each case.

Dr. C. RUSS asked if there was evidence concerning the breaking down of the complex uranium albuminate unmasking intrinsic radio-activity.

Dr. G. B. BATTEN asked whether the radio-activity of animal substances had a definite effect upon the growth of new cells.

Mr. GLEW pointed out what an amount of variability might occur in the working of electroscopes and declared that gold leaf was one of the most indefinite things that could be used.

Mr. A. LANDON WHITEHOUSE spoke of the radio-activity of tobacco, and Dr. A. H. PIRIE pointed out the necessity of eliminating any chance of dampness in the substances used.

The CHAIRMAN said that according to their ideas of the action of radio-activity the retarding effect described by Dr. Lazarus-Barlow was quite novel and seemed to clash with the fundamental theoretical ideas which apparently underlay radio-activity.

Mr. J. H. GARDINER, Dr. DUTTON, and Dr. J. GRAY DUNCANSON also spoke, and Dr. LAZARUS-BARLOW replied.

## BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

*Exhibition of Cases and Specimens.—Early Operation in Appendicitis.—Strangulation of the Epididymis and Testis by Torsion.*

A MEETING of this society was held on Jan. 6th, Mr. C. J. JACOMB-HOOD being in the chair.

Dr. HUGH GALT showed some pathological specimens, including a Glioma of the Retina, removed by Mr. W. W. Griffin from a child aged 18 months; a Remarkable Atheroma of the Circle of Willis, probably syphilitic in origin, with occlusion of numerous branches; a Uric Acid Calculus, weighing 6½ ounces, removed post mortem from the right renal pelvis of a woman aged 75 years, in whom no symptom or sign of its presence existed during life; and a Stomach showing Multiple Malignant Tumours of an Unusual Type Attached to the Peritoneal Surface.

Mr. A. H. BUCK read a paper on Some Points in Favour of Early Operation in Appendicitis.

Mr. W. A. BOWRING showed a case of Separation of the Descending Process of the Upper Tibial Epiphysis in a boy, aged 13 years. About seven months ago he first noticed a swelling of both legs in the position of the tubercle of the tibia. He had complained of pain below the knees before the swelling was noticed. The pain was chiefly on movement and not at night time. He had played football during the winter months. X ray photographs showed the condition well.

Dr. WALTER BROADBENT showed a case of Cerebral Diplegia and one of Aortic Aneurysm.

Mr. A. G. BATE read a paper on two cases of Acute Strangulation of the Epididymis and Testis by Torsion. The first of them was a patient at the Sussex County Hospital under the care of Mr. R. F. Jowers, Mr. Bate being the house surgeon at the time, while the second presented himself recently at the Hove Dispensary. The first might be called a typical case; the second was an example of the rule that a large proportion of these cases were the result of anatomical abnormality. The great majority of the patients were youths at or near the age of puberty, those under discussion being respectively 15 and 16 years old. The usual mode of onset was that during or after active exercise the patient was seized with acute pain in the groin and scrotum, felt faint, and was nauseated or actually vomited. In one of these two cases there had previously been several slight attacks of "an uneasy feeling in the testicle." Constipation was often marked. The symptoms might therefore simulate very closely those of a commencing strangulation of a hernia; and as a large proportion of these cases of torsion were associated with imperfectly descended testes, the difficulties of diagnosis might be extreme. If the case was seen early it might be possible to differentiate with ease the epididymis, cord, and testis and to appreciate the fact that the testis was tense, that the epididymis was greatly swollen, and that the spermatic cord above the twist (which could sometimes be definitely felt) was normal. The epididymis might be found to be in an abnormal position, but this did not exclude the diagnosis of torsion, for the testis might have described one complete revolution, or the axis of rotation might be horizontal. The scrotum rapidly became œdematous and the local condition soon resembled one of acute orchitis. In both the cases Mr. Bate noticed that even after the scrotum had become acutely inflamed and swollen the spermatic cord could be felt in the inguinal canal neither thickened nor inflamed. In both of them the testes were in the scrotum, although the cord was short. When the testis was in the scrotum the history would suggest a mild degree of strangulated hernia on account of the pain, shock, nausea or vomiting, constipation, and local swelling. Pain was the most obtrusive symptom; shock was not marked; vomiting was not persistent; and constipation was not absolute. The first patient was admitted to the hospital for what looked like an acute orchitis. There was, however, no suggestion of gonorrhœa or of actual injury. The swelling was incised and a twisted cord was found, the twist being rather more than one complete turn. The testis was purple and the epididymis black with a dulled surface. Castration was performed, the scrotum being drained, and the further history of the case was uneventful. The second case differed from a typical case in two ways—namely, (1) in the occurrence of premonitory attacks of pain, at which times it was probable that the testis was partially twisted and that a certain amount of hæmorrhage took place into the epididymis; and (2) in the presence of anatomical peculiarities. The epididymis was slung from the cord by a narrow band, and it was this band that was twisted. The vas deferens was continued to the bottom of the scrotum, and here ended in a mass of tissue which, when cut, looked to the naked eye like testicular tissue. The most commonly cited causes of torsion of the spermatic cord were the strains and movements due to active exercise, the engorgements of puberty, and anatomical abnormalities. As regards the treatment, castration was nearly always necessary. Two cases, however, were on record where the twist was diagnosed and reduced by taxis. There were also on record three cases in which the twist was undone and the testis left *in situ*. Of these three cases the testes became atrophied in two and the third one sloughed. Attempts to anchor the testis had also proved ineffectual. Mr. Bate nevertheless thought that it might be possible to avoid castration if the condition was diagnosed in an early stage.

## EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

*Discussion on Syphilis and Marriage.—Treatment of Phthisis and Other Conditions by Injection of Arylarsonates.—Cremation.*

A MEETING of this society was held on Jan. 5th, Dr. BYROM BRAMWELL, the President, being in the chair.

Dr. C. W. MACGILLIVRAY introduced the subject of discussion, Syphilis and Marriage. He said that syphilis together with gonorrhœa and soft sore formed the chief varieties of venereal disease. The latter had little relation to marriage, while gonorrhœa led to disease and to a diminution of the population almost equal to that produced by syphilis. Syphilis during the active period of life did not lead to sterility, but 42 per cent. of miscarriages and abortions were due to it, and many of the children who survived were diseased. In cases where both parents were syphilitic the proportion of miscarriages might be 70 per cent., and Fournier had stated that of 90 women infected during the first year there were 50 abortions, 38 children were born alive, but soon died, and only two survived. As regards the attitude of society towards venereal diseases, Dr. MacGillivray said that nothing was done as to instructing young adults, but it was left to the physician to cure or prevent the contagion, and he might endeavour to

prevent or delay marriage. The treatment generally occupied from three to four years, and the question of medical secrecy was alluded to. In referring to the historical aspect, Dr. MacGillivray said that with greater knowledge of the disease different views were adopted. Sixty years ago treatment for three to four months was considered sufficient. Fournier had stated in 1861 that a course of three months of mercury followed by three months of treatment by iodide of potassium was sufficient. In 1872 treatment for two years by mercury was deemed necessary; this had extended to four years in 1881, while in 1897 a six years' treatment was thought to be necessary at times. In cases of prematrimonial syphilis, the question arose as to whether the syphilitic should marry, and this was a difficult question to decide. In gonorrhœa the presence of the gonococci and complications guided one, but in syphilis the detection of the specific organism was not so useful a guide. The question did not so much lie in the fact of a cure, but as to whether the risks to wife, children, or self were so slight as not to enforce celibacy. In determining this question one had to consider it on purely sanitary and not on sentimental grounds. (1) Risks to the wife. About 75 per cent. of married women who were syphilitic had contracted it from their husbands (*a*) directly from syphilitic lesions on their husbands or (*b*) conceptionally, the infected fœtus infecting the mother in turn. After referring to Colles's law Dr. MacGillivray treated of (2) the risks to the offspring. He said that it was not remarkable that hereditary syphilis did not impair fertility unless the testicles themselves were affected. The parental syphilis was communicated by infected sperms or ova, or through the utero-placental circulation during pregnancy. The mother was not invariably infected and might later be infected from another source. Fully 28 per cent. of paternally infected fœtuses died in utero or shortly after birth, and if the mothers were infected the mortality was much greater. In cases of mixed hereditary syphilis the mortality was 60–80 per cent. in utero, while one-third of those born alive died within six months. If one parent suffered from heredo-syphilis, of 81 pregnancies there would probably be 28 abortions, 13 premature births, 7 dying soon after birth, and 33 would survive. As regard the conditions which were necessary to permit syphilitics to marry, it was first necessary to be sure of one's diagnosis. If a case were really syphilitic and marriage was to take place soon, then one ought to interdict it if the patient refused to submit to treatment. It was a most interesting but a difficult question to decide as to the duration of the contagion and the length of the transmissive period. An active syphilitic might beget healthy children. The mere fact of not finding the spirochæte did not show that the case was not contagious. There was no absolute proof of the non-contagiousness of tertiary lesions. It had to be remembered that secondaries might develop long after the usual period, while tertiaries might be precocious and both might be contagious and not amenable to treatment. Clinical observation showed that if secondary accidents had been absent for from 12 to 18 months, and if the patients were properly treated for 2½ to 3 years, the risks of contagion had ceased. A safe rule to adopt was that if there had been no manifestations for 18 months, and that a period of 4 years had elapsed since the primary sore, that the patient had been properly treated and was in good health, he might be allowed to marry. Exceptionally the contagion might persist for from 5 to 10 years after the chancre, and Fournier had related the case of a man who, 7 seven years after his chancre, procreated a syphilitic fœtus which infected his wife. The hereditary transmission was important on account of the danger to the offspring. Transmissibility persisted longer than the contagion. As to the treatment: without any, abortion was the rule; with treatment, healthy children were born; when treatment was stopped, syphilitic children were born. Treatment might not actually cure the disease, but at any rate would hold it in abeyance. In one case, a syphilitic woman bore seven syphilitic children, but during her eighth and ninth pregnancies she was under treatment and the children were healthy. She thought herself cured and gave up the treatment, with the result that her tenth child was syphilitic, but on resuming treatment her eleventh was healthy. Fournier stated that of 14 syphilitic married men untreated, in 45 pregnancies 37 children died, or a mortality of 82 per cent., while in another series properly treated 3 per cent. died. With respect to the personal risks to the husband as regarded marriage, malignant syphilis practically interdicted marriage for all time, and, in fact, nearly all such cases died early. Mild syphilis was often followed by severe tertiaries, which might kill the patient or cause chronic invalidism. As to post-matrimonial syphilis the question was one of infection. The husband had to be treated so as to prevent infection; he had to be instructed as to his mode of life; there was the question as to whether the wife should be told. If the wife were healthy but pregnant there was the question of treating the wife although she had no symptoms. Dr. MacGillivray illustrated his paper with numerous examples from his own practice.—Dr. T. S. CLOUSTON said that cases of idiocy, developmental general paralysis, and brain syphilis were the results of congenital disease which had come under his observation. Certain kinds of syphilitic idiocy were often associated with epilepsy; these were of a very incurable kind and shortened life to a great extent. Developmental general paralysis occurred very seldom, but was a direct result of syphilis and no anti-syphilitic treatment had any effect. About 1 to 3 per cent. of all syphilitics fell into general paralysis.—Dr. F. W. N. HAULTAIN said that in all cases where syphilis was acquired before or during conception abortion occurred. If syphilis were acquired during the first three months of pregnancy abortion was very frequent, and if it were acquired later then a healthy child was born. Paternal syphilis was by far the most frequent. He had great doubt in his own mind as to the truth of Colles's law. Some women aborted regularly and yet showed no trace of syphilis; such were cases of paternal fœtal infection. Treatment given to the mother was in reality treatment given to the fœtus because of the extreme solubility of the mercurial salts and because of their ready transmission through the vessels of the placenta into the fœtal circulation. In such cases the mother has really never had the infection.—Professor F. M. CAIRD said that of all the syphilitic men whom he had treated only one had written to him as to his condition after marriage. Of course, a great number of syphilitics died at an early age, usually before the age of 40. Many men infected had no treatment whatever. He had known of many men who had married from 7 to 10 years later and who had raised healthy offspring. There was no absolute time-limit as to the period which must elapse before marriage.—Dr. R. CRANSTON LOW said that a patient with syphilis might be cured and later might be reinfected. He thought that the Wassermann reaction would show whether the patient had or had not had syphilis.—Mr. J. W. B. HODSDON said that if syphilis were treated early and promptly it was a curable disease. He knew of one case where a man contracted a second attack of syphilis only two years after a first.—Mr. ALEXANDER MILES quoted Mr. Jonathan Hutchinson's statement that two years of effective treatment was sufficient, and that the four or more years of treatment as adopted in France was a counsel of perfection and hence not attainable.

Dr. R. A. LUNDIE and Dr. R. H. BLAIKIE, in a paper on the Treatment of Phthisis and Other Conditions by Injection of Arylarsonate, said that Dr. R. Van Someren had accidentally discovered, while working at sleeping sickness in Uganda, that this treatment does much good in leprosy, and suggested to Dr. Lundie and Dr. Blaikie that it was worth a trial in tuberculosis. Both he and they used sodium para-aminophenylarsonate ("soamin"). In several specific cases much benefit had followed. Dr. Lundie and Dr. Blaikie called special attention to four cases of advanced and extensive phthisis (bilateral), all young women who had been under observation for some time when this treatment was begun. All had much cough and expectoration, and in all these quickly diminished; in one both had ceased within a month, and no sputum could now be obtained for examination. In all, even one who was rapidly sinking from anorexia and vomiting, appetite quickly improved, to the great benefit of the general nutrition. Two had retained this improvement till now (over 13 months); one had had a recurrence of cough, hæmoptysis, &c.; one, who was vomiting before, had a return of her failure of digestion and died six months after treatment was begun. Two or three other tuberculous cases had shown less striking improvement; some were unaffected; none, so far as was known, was harmed. In most of their cases, including the four specially referred to, Dr. Van Someren's method had been followed—

namely, an injection of 10 grains on each of two successive days, then a fortnight's interval. In one of their 24 cases 10-grain doses caused abdominal pain and vomiting; but 5-grain doses were well borne. In contrast to the experience of others, they found that pain generally followed each injection in about one-third of the patients; it usually began 8 to 12 hours and ceased less than 24 hours after it, but in some cases immediately followed it.

Dr. W. G. AITCHISON ROBERTSON gave a communication on Cremation. He advocated its employment, on economic, hygienic, and medico-legal grounds. Dr. Robertson illustrated the paper with a series of lantern slides. As a result of the communication a large number of medical men joined the newly formed Cremation Society of Edinburgh.

## ROYAL ACADEMY OF MEDICINE IN IRELAND.

### SECTION OF SURGERY.

*Malignant Disease of the Large Intestine.—Empyema of the Ethmoidal Cells.*

A MEETING of this section was held on Dec. 17th, 1909, Mr. JOHN LENTAIGNE, the President, being in the chair.

Mr. E. H. TAYLOR read a paper on the Operative Treatment of Malignant Disease of the Large Intestine.—Sir THOMAS MYLES asked if Mr. Taylor wished them to assume that in the operations under discussion the glands were obviously diseased at the time or that the removal of the whole area was intended as a prophylactic before there were any visible evidences of glandular disease. Assuming that the intermediate glands were palpably diseased, were they justified in concluding that removal of the area, immediately below the point at which the main branch of the inferior mesenteric artery came off, would guarantee the non-existence of the disease above that point? The paper had borne out what had been observed clinically—namely, that in certain cases of removal of the lower bowel when they got above a certain point it was better to remove more and get a mobile colon than to bring down the upper part of the rectum.—The PRESIDENT recalled a case which supported Mr. Taylor's remark, that the whip-cord form of cancer of the rectum was most amenable to surgical treatment and least likely to give trouble by recurrence in the glands at an early stage. The patient was an old woman suffering from obstruction of the large intestine. He opened the abdomen over the cæcum and found a lump on the left side of the abdomen opposite where his incision had been made. It seemed to be fairly moveable and he made an intestinal fistula by uniting the cæcum to the lips of the incision. The symptoms of obstruction at once got better, and shortly afterwards he performed a laparotomy and found the growth, which was a slow-growing cancer of the lower segment. He removed it with about two inches of intestine above and below. An end-to-end anastomosis was done and the patient apparently got quite well. Nine years later she became ill again and he found her in a dying state with unmistakable evidence of rectal cancer, and she died within a fortnight. The recurrence must have been at an exceedingly slow rate.—Mr. TAYLOR, in reply, said that even if no glands could be found diseased he thought the complete operation should be carried out. If there was reason to believe that some of the secondary glands were involved he was afraid that the hope of radical cure was not great. Where the glands along the inferior mesenteric artery were diseased the chance of a radical cure would be absolutely *nil*.

Dr. O. GOGARTY read a paper on a case of Suppuration of the Ethmoidal Cells, with Symptoms of Trigeminal Neuralgia. The patient was a man, aged 31 years, who had been suffering for 13 years from facial neuralgia of epileptiform type on the left side. The attacks were frequent and often recurred several times in an hour. For nine months he lived on fluids alone, being unable to masticate. In 1902 all the teeth, though sound, were removed above and below from the left side. Later the infra-orbital nerve was resected. He would not submit to removal of the Gasserian ganglion. In 1907 he came under Dr. Gogarty's care. On the antrum being washed out a streak of pus was found. Both antrum and frontal sinus were sound. It was then decided to open the ethmoidal cells. Pus came away freely when this was done and subsequently necrosed bone and débris were removed. There has been no recurrence of neuralgia since March, 1907. Dr. Gogarty's method of dealing with the case was as follows: The anterior third of the middle turbinal bone was removed with Grünwald's scissors and Stoerk's snare, and the superior margin of the cut surface was punched away to the lamella with a conchotome. Five days later a sharp curved knife (Hajek's hook) was pressed against this, turned into the ethmoidal cells and pulled downwards; pus at once came into view. A paroxysm ensued. When the patient recovered the opening was enlarged and the pus followed with a conchotome. The anæsthetic was local—40 per cent. of cocaine solution. No tampon was introduced; the anterior naris being plugged with cotton wool and the patient warned against blowing his nose. On the continent 92 per cent. of cases of empyema in the nose were supposed to come from influenza, and he considered that the present case probably began with influenza infecting the frontal sinus, the decomposition in the confined space breaking down the septa and giving rise to the empyema.—Mr. TAYLOR said that the communication might be the means of bringing before the notice of specialists an efficient operation, less extensive than the removal of the Gasserian ganglion.—The PRESIDENT also spoke of the desirability of giving a wide circulation to the paper, which was of the utmost importance and value.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on Jan. 5th, Dr. A. Fulton, the President, being in the chair.—Mr. Kenneth Black read a paper on Surgical Odds and Ends. He first dealt with the value of X rays in detecting needles, bullets, and other foreign bodies embedded in the tissues, and pointed out that small foreign bodies frequently altered their position, and that an X-ray examination to be of use should immediately precede an operation. He gave several cases showing the uselessness of operating several days after the screen examination. Mr. Black then showed two Pathological Specimens of Medico-criminal interest, the first showing a knife blade embedded in the cervical spine between the axis and the atlas and dividing the spinal cord, and the second showing a portion of the left fifth rib with a portion of the skin and a bullet. The use of sulphur in acute infective cellulitis and tuberculous disease was then dealt with and again illustrated by several cases. An emulsion of powdered sulphur and glycerin with a little carbolic acid had been packed in the wounds described for 24 hours and was followed by fomentations. This appeared to be a most powerful germicide. Models of a Mouth Gag were then shown which were devised to overcome the difficulty of insertion between clenched teeth and to prevent the gag when inserted from slipping forward. Curious sequelæ discovered owing to the Workmen's Compensation Act were mentioned, a case of renal calculus following an abdominal injury two and a half years previously being described. Another case of a crushed wrist brought to light an old-standing osteoma. The value of flexion in treating fractures about the elbow-joint was next touched upon, and finally a note was made of a rare case of Phlegmonous Duodenitis.—The President, Dr. F. H. Jacob, Dr. J. Watson, Mr. J. W. M. Hunter, Mr. J. Mackie, and Mr. C. H. Allen took part in the discussion.

HASTINGS AND ITS CHARITIES.—A movement has been on foot at Hastings for some time for the coördination of the several local relief agencies in the town. In November the scheme was discussed at the annual general meeting of the local Charity Organisation Society, when it was explained that the reason for the change was the unconscious overlapping of the relief of distress in the town, which necessitated a waste of the funds and a waste of effort. No new principles are to be involved in the scheme, which will be representative of all organisations which are in one direction or another interested in the poor of the town. The proposal brought about some resignations from the executive committee of the society, but a conference of representatives of the various bodies, however, passed without dissent a resolution approving the scheme, and on Jan. 3rd the Charity Organisation Society adopted the proposal and appointed a committee of six to serve as the representative council to promote the scheme.

# Reviews and Notices of Books.

*A System of Operative Surgery by Various Authors.* Edited by F. F. BURGHARD, M.S. Lond., F.R.C.S. Eng., Teacher of Operative Surgery in King's College, London; Surgeon to King's College Hospital; Senior Surgeon to the Children's Hospital, Paddington Green. In four volumes. Vol. II., pp. 720. London: Henry Frowde; Oxford University Press: Hodder and Stoughton. 1909. Price 36*s.* net per volume, or £6 net per set of 4 volumes.

WE are glad to see the second volume of this system. The first part deals with the operations for tuberculous affections of the bones, and this is contributed by Mr. Harold J. Stiles of Edinburgh. It contains much that is of great value, but perhaps the most striking article in the contribution is that dealing with resection of bone for primary tuberculous osteomyelitis of the diaphysis. The author speaks very favourably of this method of radical removal of tuberculous disease. He describes the operation carefully both in its general principles and as applied to individual bones, and the results which he has obtained go far to justify his predilection for this method of treatment. The method is comparatively little employed, but Mr. Stiles's arguments are very suggestive. The great difficulty most surgeons have experienced in employing this method has been to prevent shortening, especially in those parts of the limb where there is only a single bone. The modern tendency to eradicate completely tuberculous disease whenever accessible finds its latest expression in this method, but we are not prepared to say that the benefits obtainable by its employment are sufficiently striking to require a surgeon always to adopt it to the exclusion of milder if less radical methods. In the account of the evacuation of an iliac abscess the caution is given that care must be taken in the use of a flushing spoon. With this caution we thoroughly agree, for we feel sure that much harm is done by the vigorous use of a spoon on the lining of these abscesses, and we cannot think that any benefit following is at all commensurate with the risks it entails. The author employs the expression, "short long-bones," to describe the bones of the phalanges, the metacarpus, and the metatarsus. We cannot consider this happy.

The second part, dealing with the operations for tuberculous affections of the joints, is also from the pen of Mr. Stiles. He lays it down as clear that if a tuberculous focus is seen by means of a skiagram to be present at the end of one of the bones entering into the joint, the best treatment is to proceed at once to the evacuation of this tuberculous mass so as to cut off the source from which the infection of the joint is coming. We wish to express our cordial agreement with this method of treatment, for to allow a tuberculous focus to continue to infect a joint is quite contrary to modern methods of treatment. The whole section is extremely good, and we regard both of Mr. Stiles's contributions as valuable expositions of the most advanced treatment of tuberculous disease.

Mr. Edmund Owen has contributed the chapters dealing with the operations for hare-lip and cleft palate. We need say nothing about the operations for hare-lip beyond mentioning that we are glad to see the author draws attention to the danger of asphyxia in some cases where a wide hare-lip has been closed. This risk is often forgotten and some untoward results have occurred. With regard to the operation for cleft palate, it is well known that Mr. Owen is the chief exponent in this country of the method of employing pressure in the treatment of cleft palate in very young children. Reeves of Melbourne appears to have been the first to advocate the reduction of the width of the cleft by forcibly pressing together the two maxillæ, but to Brophy of Chicago is undoubtedly due the credit of making the method widely known, and Mr. Owen emphasises strongly the value of Brophy's operation in children under the age of six months. It is early yet, perhaps, to express a decided opinion of the value of Brophy's methods, and the success of the operation depends, not only on the skill of the surgeon, but also on the health of the child, but we are inclined to think that in the future some such method will be looked upon as the best mode of dealing with cleft palate should the health of the child allow of its performance. A few more diagrams illustrating the method might have been useful.

Mr. G. Lenthal Cheatle has written a chapter on operations for cancer of the lips and face. This is a department of surgery with which Mr. Cheatle's name has been much associated, so that we felt sure of obtaining a valuable account, and in this expectation we are not disappointed. Operations upon the jaws have been described by Mr. C. H. Fagge. We are interested to see that von Eiselsberg's operation for increasing the width of the jaw is described. We are not aware that his operation has ever been performed in this country, and we should be interested to learn of any case that has been done. It is decidedly ingenious and cases occasionally occur really suited for it.

Mr. Butlin's article on operations upon the tongue, tonsils, and pharynx is especially valuable because the author when writing it restricted himself to an account of those operations which he himself is in the habit of performing. Such an account, by a surgeon of Mr. Butlin's eminence, is of far greater value than any mere routine repetition of the operations described in the ordinary text-books. We are interested to see that Mr. Butlin gives a tabular statement of 200 cases of operation for carcinoma of the tongue which he himself has performed. Of these 57 were successful, the patients living free from recurrence for periods varying from three to 22 years. This is a result of which any surgeon might be proud, and these statistics, from which we have only quoted one item, will long remain of value as indicative of the results of the best practice. It is worthy of note that since the beginning of the year 1900 Mr. Butlin has performed preliminary laryngotomy in every case of removal of cancer of the tongue. The wound left by this laryngotomy is usually quite healed, we are told, in three or four days. In cases of malignant disease of the tongue where the extent of the involved tissues necessitates a very wide operation, and especially when the base of the tongue is affected, Mr. Butlin clears out the contents of the anterior triangle and excises the external carotid artery of the more affected side. At the same sitting the external carotid artery of the opposite side is tied or even partly excised if the patient's condition will stand it. 10 or 12 days later the operation on the tongue is performed. The disease is attacked from the opposite side of the neck, the pharynx being opened so as to afford access to the base of the tongue. We need not describe in detail the very thorough and extensive operation which Mr. Butlin performs in these widespread cases, but it is satisfactory to learn that immediate success has followed, even in old and feeble subjects, but a recurrence has been almost invariable, though it has in some cases been deferred for more than a year. The return of the disease occurs, he tells us, most frequently in the neighbourhood of the upper part of the larynx. He is strongly in favour of the systematic and routine removal of the glands of the neck in all cases of carcinoma of the tongue. We would direct especial attention to the valuable discussion inserted here on many points in connexion with the removal of glands in cases of carcinoma of the tongue; it presents clearly the arguments on both sides.

Mr. Fagge has contributed the section on operations

upon the œsophagus, and it represents our present knowledge of the subject. It would have been difficult to select a more suitable writer for the part concerned with operations of the stomach than Mr. B. G. A. Moynihan of Leeds, and we need only say that the account is written with his usual clearness. All who are acquainted with the author's well-known work on the surgery of the abdomen will know what to expect in an article on gastric surgery from his pen.

Mr. G. H. Makins has described the operations upon the intestine, and we have seldom met with a more readable account of this important branch of surgery. The abundant illustrations still further increase its value. Especially would we commend the account given of the operations on the large intestine, perhaps the most difficult region of intestinal surgery; and that dealing with intestinal obstruction. Mr. Arthur E. Barker has contributed the section on hernia, and, naturally, the most important part of this deals with the radical cure of inguinal hernia. He prefers Bassini's operation, though he describes also Kocher's and Halsted's operation.

Operations upon the rectum and anus have been described by Mr. F. Swinford Edwards. The first portion of his article is devoted to methods of examination of the rectum, and though it is excellent as far as it goes, we cannot help regretting that it is somewhat brief. If there is one place in connexion with diseases of the rectum in which the general practitioner desires ample guidance it is in methods of examining that portion of the bowel, and therefore in a work like this it is highly desirable that the methods should be fully described. The accounts of the operations are really very good, but here also we must confess that to us they appear to err on the side of brevity. This may possibly have been due to limitation of the space allotted to the author; if so, it would only be another instance of the fact that in this country rectal diseases do not receive their fair share of attention.

We are glad to find that, on the whole, this second volume is fully equal to the first, both in interest and in quality.

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*A Handbook of the Diseases of the Nose and Throat.* By EUGENE S. YONGE, M.D. Edin., Physician to the Manchester Hospital for Consumption and Diseases of the Throat, &c. With 55 plates. Edinburgh and London: William Green and Sons. 1909. Pp. 407.

Dr. Yonge has written this book entirely for the use of general practitioners and has, in view of what he considers to be their requirements, dealt very fully with the more common diseases of the nose and throat, but more concisely with the rarer ones. The subjects are grouped under four main headings—namely, diseases of the nose and its accessory cavities, diseases of the pharynx, diseases of the larynx, and fourthly, those morbid conditions of the upper respiratory tract which occur as complications and sequelæ of more or less general affections.

In the first section, after dealing with the anatomy of the nose and its cavities, the methods of examination are dealt with, and Dr. Yonge gives a great deal of thoroughly practical and most valuable instruction in the methods of treatment. Under the heading of nasal polypus we naturally turn to see what he has to say on the subject of etiology, and we are glad to read the temperate and straightforward way in which he deals with the opposing theories. Under the one heading Paroxysmal Coryza the author includes paroxysmal sneezing and idiopathic rhinorrhœa, which seems to be of more than dubious propriety. Although both conditions are considered as of nervous origin, that is certainly the only point they have in common, and a separate heading would be of advantage. The whole of the section on nasal disease, with the exception of the above minor point, is very well and clearly written.

We believe that Dr. Yonge will find it advisable in his next edition to devote more space to direct laryngoscopy as a means of dealing with all laryngeal diseases needing surgical interference, otherwise we have but little criticism to offer of the remaining sections. They are full of well-selected material treated in a readily comprehensible manner. We have confidence in predicting a wide sphere of usefulness for the book. The illustrations are excellent, the descriptions are clear, and the teaching is sound.

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*The Diseases of Infancy and Childhood: for the use of Students and Practitioners of Medicine.* By L. EMMETT HOLT, M.D., Sc.D., LL.D., Professor of Diseases of Children in the College of Physicians and Surgeons (Columbia University), New York; Attending Physician to the Babies and Foundling Hospitals, New York, &c. With 239 illustrations, including 8 coloured plates. Fifth edition, revised and enlarged. London and New York: D. Appleton and Co. 1909. Pp. 1171. Price 25*s*.

Dr. Emmett Holt's work on "The Diseases of Infancy and Childhood" has achieved an established position as a work of reference on the subject, and is of special value in presenting the methods of diagnosis and treatment employed by American pædiatrists. We have in reviewing former editions indicated the comprehensive character of the book and the general method of treatment of the subject. In our notice of this, the fifth, edition it will only be necessary to refer to the changes that have been made in order to incorporate recent advances in connexion with special subjects. The most important of these have been made in the chapters on General Tuberculosis, Tuberculous Meningitis, Cerebro-spinal Meningitis, and Acute Poliomyelitis, some of which have been rewritten and others considerably revised.

The subject of tuberculosis is dealt with at some length in an interesting manner. Statistics are given from American and continental sources of the frequency of tuberculous disease at various ages, and are compared with the results of von Pirquet's cutaneous tuberculin reaction, a general correspondence being noticeable. In regard to the modes of infection Dr. Holt believes that the most frequent is from direct association with persons suffering from pulmonary tuberculosis, and that infection by milk is relatively rare. In regard to the channel of infection he strongly upholds the view that this is most frequently the respiratory tract, and points to the frequency of tuberculous deposit in the bronchial lymph glands in support of this. He admits that the tonsils may be a portal of entry, but dismisses with but curt reference the work of Calmette and his followers on the alimentary route of infection to the bronchial glands, which he believes to be exceedingly rare in the human subject. The most interesting section of this chapter is that dealing with the question of the diagnosis of tuberculous disease in childhood and infancy. By the simple expedient of exciting cough and collecting the sputum brought up on a swab or a piece of muslin caught in a pair of artery forceps, Dr. Holt has succeeded in demonstrating the presence of tubercle bacilli in over 80 per cent. of his hospital cases of pulmonary tuberculosis in infants. As a result he is enabled to describe a condition of tuberculous bronchitis, with physical signs like those of ordinary bronchitis, but with bacilli present in the sputum. A good critical account of the various forms of the tuberculin reaction is given, the inoculation, ophthalmic, cutaneous, and inunction tests being considered separately, and an account is also given of the puncture-reaction of Hamburger. Dr. Holt's review of the practical value of these tests in regard to the questions of reliability, freedom from risk, and ease of application is worthy of special

commendation. For the inoculation or injection test Dr. Holt advises doses of half a milligramme for infants under six months and one milligramme for those who are older, which are larger than are often recommended. He states, however, that he has never seen unfavourable results, but he gives the average reaction as 103·3° F., which might be regarded as unnecessarily high. We could also wish that he had made some mention of the effects of repeating these tests at short intervals.

The account given of tuberculous meningitis is clear and concise. The diagnosis is also lucidly discussed, and useful directions are given as to the method of demonstrating tubercle bacilli in the fluid withdrawn from the spinal theca by lumbar puncture. Cerebro-spinal meningitis due to the diplococcus intracellularis of Weichselbaum is very fully dealt with, and the account given of the clinical forms of the disease and of its effects is admirable. Treatment is also discussed at some length, and the use of the serum prepared by Flexner is recommended as showing a larger proportion of recoveries than treatment by other methods. Chronic basilar meningitis is briefly described as a form of this disease.

The description of acute poliomyelitis includes the important information obtained in connexion with recent epidemics of the disease, notably the very extensive one in New York and its vicinity in 1907. The wider conception of the disease necessitated by the study of its epidemiology and morbid anatomy is set forth, and it is described as an acute inflammation of the central nervous system due to some obscure and as yet unrecognised infection. The description of the morbid anatomy is based on the observations of Harbitz and Scheel, and the failure of attempts to find organisms in the cerebro-spinal fluid in the New York cases is mentioned.

This fifth edition of Dr. Holt's book has evidently been carefully revised, and it should worthily maintain the reputation of its predecessors as a useful and authoritative work of reference.

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*Die Röntgenuntersuchung der Brustorgane und ihre Ergebnisse für Physiologie und Pathologie.* By Dr. HANS ARNSPERGER of Heidelberg. Leipsic: F. C. W. Vogel. 1909. Pp. 263. With 52 plates. Price 12 marks.

THIS book constitutes a very important addition to the literature of the Roentgen diagnosis of chest disease; and no one reading it can fail to see that it is written by a man who is a more or less complete master of his subject. The author assumes a knowledge of technique on the part of his readers and devotes himself more particularly to the clinical aspects of the cases under review; but at the same time he deals somewhat fully with various questions of physiology and pathology, illustrating his views by means of investigations which he has conducted himself. There is a preface written by Professor Krehl of Heidelberg, laying stress upon the necessity of keeping in mind the physiological and pathological aspects of the case while making the Roentgen-ray examination. And Dr. Arnsperger with all his enthusiasm does not attempt to place Roentgen diagnosis on any higher plane than it deserves, or to encourage us to place reliance upon it to the exclusion of the more classical methods of diagnosis.

We are pleased to note the importance given to the oblique and lateral examinations, which are of the greatest value and afford evidence of the most positive kind. Yet they are too often neglected in conducting X ray examinations of the thorax. The section on heart disease is also of particular interest. Here the author shows how we may with practice recognise almost every pathological condition of the heart and great vessels. But in all cases he insists upon the screen examination being more important than radiography. The latter is useful to record what we have observed; the diagnosis must be made with the screen.

Not the least attractive part of the book are the 52 reproductions of X ray pictures of cases of thoracic disease. These are on heavy plate surface paper, and we should think that very little detail of the original negatives has been lost in the printing and reproduction.

The book will be found of great interest to physicians and radiographers alike.

## LIBRARY TABLE.

*Lectures on Surgical Nursing.* By E. STANMORE BISHOP, F.R.C.S. Bristol: John Wright and Sons, Limited; London: Simpkin, Marshall, Hamilton, Kent, and Co., Limited. 1909. Pp. 143. Price, cloth, 2*s.* 6*d.*, or leather, 3*s.* 6*d.* net.—This small book is altogether excellent. The technique of modern surgery is so elaborate, although reasonable, that most books dealing with the subject written for nurses may be said to come under the anathema pronounced in the Prayer Book against the Pie—namely, that it is more difficult to find out what to do than to do it when it is found out. But Mr. Bishop has given a set of lectures in which what to do is set forth in simple, plain, and interesting language. When any regulation is laid down the reason for so doing is given. His final paragraphs as to the behaviour of nurses in a private house are admirable. We have only one suggestion to make, and that is that in a future edition it should be made plain that the lectures do not deal with all forms of surgical nursing, as the title might be taken to imply. In fact, they deal almost entirely with female patients.

*Household Pests and Household Remedies.* By W. R. BOELTER. London: John Bale, Sons, and Danielsson. Pp. 172. Price 2*s.* 6*d.*—Mr. Boelter is well known as an uncompromising enemy of the rat, and in this book he has extended his vermin studies to other varieties of household pests, such as bugs, fleas, flies, lice, cockroaches, and the like. He gives a popular and more or less scientific account of these various pests, together with directions for getting rid of them. We should hesitate to confirm his view that midges are quite harmless, although as far as is known they do not transmit disease, while the common gnat Culex pipiens *is* a mosquito. Mr. Boelter's remarks upon the necessity for getting rid of bugs, flies, lice, and other vermin are sound. Even if they do not always spread disease, they are at least a sign of dirt and insanitary conditions, and therefore should be exterminated. We are particularly pleased with his plea for the owl and the kestrel as destroyers of mice and rats, which we hope may lead to these useful birds being spared by keepers and farmers.

*The Value of an Exclusive Proteid Diet in Certain Digestive Disorders.* By ERNEST C. YOUNG, M.D. Durh. London: The Medical Publishing Company. 1909. Pp. 23. Price 1*s.* 6*d.*—This is a reprint of a paper in the *Clinical Journal*. The author advocates a diet of minced meat and hot water for conditions of maldigestion, which he does not fully specify but describes somewhat vaguely as chronic gastritis, chronic hyperchlorhydria, and dilatation of the stomach. The chief points of difference between the method advocated and that of Dr. Salisbury is that the meat is cooked by a careful process and the water is taken not with, but between meals. There are some valuable hints as to the management of the severe forms of chronic dyspepsia given at the end of the paper.

*Primary Studies for Nurses.* By CHARLOTTE A. AIKENS. London and Philadelphia: W. B. Saunders Company. 1909. Pp. 428. Price 8*s.* net.—The subtitle of this book defines its scope. It is called "A Text-book for First-year Pupil Nurses, containing Courses of Studies in Anatomy, Physiology, Hygiene, Bacteriology, Therapeutics and Materia Medica, Dietetics, and Invalid Cookery." The "courses of studies," however, seem to us to have fallen occasionally between two stools. That is to say,

they are far too superficial to be of much use to an ignorant person who reads them with a desire for self-teaching, and if they are intended as guides for the teacher they contain information which every teacher should know. In the introduction, which for the most part is soundly and well written, we note that the courses are called lessons, to be amplified by the teacher. The anatomy and physiology section is weak, and would be only of the very slightest use unless amplified by an intelligent teacher. The section on hygiene, both general and personal, is good, especially that portion dealing with personal hygiene. The section of bacteriology is very poor and in our opinion might have been omitted altogether, except the paragraph entitled "General Considerations," which is useful. The section on materia medica and therapeutics, again, will want much amplification, and Miss Aikens in her next edition should get someone to revise her Latin; "alternis nocte" is not the Latin for "every other night," neither is "dolor unguente" the Latin for "when the pain is severe." The chapter on the administration of medicines is, on the whole, good, but hypodermic injections are not, as a rule, intermuscular injections, and in giving an ordinary hypodermic injection it is not muscle which is "picked up with the left hand," but skin. The remainder of the book is taken up by remarks on dietetics and invalid cookery, with a series of questions for self-examination. It is a very unequal work.

## JOURNALS AND MAGAZINES.

*The Quarterly Journal of Medicine.* Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GARROD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE. Vol. III., No. 10, January, 1910. Oxford: At the Clarendon Press. Subscription, price 25*s.* per annum; single numbers, 8*s.* 6*d.* net each.—This number contains the following papers:—1. The Importance of Optic Neuritis and Retinal Hæmorrhages in the Diagnosis of Chronic Septic Endocarditis, by A. W. Falconer. In 15 cases of this condition optic neuritis was found in five, and appeared to be a toxæmic manifestation, occurring comparatively early in the course of the disease. In four of the cases there were also recurrent retinal hæmorrhages. In one case the discovery of the optic neuritis was of distinct assistance in the early diagnosis of the septic character of the endocarditis. 2. A case of Partial Heart Block occurring during an Attack of Acute Rheumatism, by John Cowan, James W. McLeod, and Albert R. Paterson. This paper is illustrated by good tracings showing that the condition was due to defective conduction in the *a.v.* bundle. 3. Rat-bite Fever, by T. J. Horder. Notes are given of three cases in which a periodic fever occurred after rat-bites, characterised by spontaneous recovery after prolonged course. Blood culture and blood film examinations gave negative results. 4. Remarks on the Study of a Case showing a Greatly Lengthened *a-c* Interval with Attacks of Partial and of Complete Heart Block, with an Investigation of the Underlying Pathological Conditions, by T. Wardrop Griffith and Alfred E. Cohn. A detailed record is given, illustrated by numerous tracings and a plate showing the condition of the heart at necropsy. Histological examination showed that the auriculo-ventricular bundle was seriously compromised in its main stem and that the left branch was cut off, the lesion being apparently syphilitic. 5. A Study of the Cerebro-spinal Fluid in the Infective Diseases of the Meninges, with Special Reference to Cerebro-spinal Fever, by Andrew Connal. A routine examination of the fluid drawn off by lumbar puncture in cases of meningitis is recommended, since changes in this fluid indicate the progress of the infection and their interpretation is of great value in prognosis and diagnosis. In meningitis from any cause the normal transparency of the cerebro-spinal fluid is lost. A yellow or greenish colour in a turbid fluid occurs in the early stages of cerebro-spinal fever. A coagulum is one of the earliest signs of meningeal inflammation. The absence of a reducing sugar from the cerebro-spinal fluid is pathognomonic of meningitis, but sugar is not absent at all stages of cerebro-spinal fever. Interesting details are given of the cytology and bacteriology of the fluid. This paper is the outcome of a large amount of laborious work, and is a valuable contribution to the literature of the subject. 6. Concerning Intermittent Hydrarthrosis, by Archibald E. Garrod. The peculiar features of this condition are clearly described and some cases recorded. The view of Schlesinger that it is nearly akin to acute circumscribed œdema is quoted with approval. Other associated conditions are considered and the treatment is discussed. 7. Critical Review: Lactic Acid in Metabolism, Part I., by J. H. Ryffel. The identification of lactic acid in the tissues and fluids of the body, its influence on various functions, its origin and fate are discussed, and a bibliography is appended.

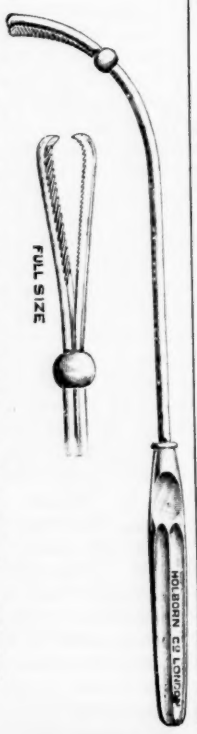
*Progressive Medicine.* A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. LANDIS, M.D. Vol. XI., No. 4. Whole number, 44. Dec. 1st, 1909. Philadelphia and New York: Lea and Febiger. Pp. 334. Price $6 per annum.—This number contains reviews of recent work in regard to—1. Diseases of the Digestive Tract and Allied Organs, the Liver, and Pancreas, by Dr. David L. Edsall. Clear and adequate summaries are given of many recent interesting original papers from English, American, French, and German sources. Of especial interest are those on the genesis of gastric ulcer and the nature of auto-digestion by Katzenstein, the pathogenesis and etiology of chronic achylia gastrica by Faber and Lange, and the important work of Kuttner on carcinoma of the stomach. The problems of diagnosis and of the value of surgical methods of treatment are dealt with in a practical and suggestive manner. The observations of Hertz on constipation are also reviewed, and recent work on duodenal ulcer, appendicitis, and hepatic cirrhosis is summarised. The diagnostic value of the Cammidge reaction in pancreatic disease is discussed in some detail. Dr. Edsall not only gives admirable accounts of the various papers but also adds many valuable and pertinent critical remarks in regard to many of them. 2. Diseases of the Kidneys, by Dr. J. Rose Bradford. The recent important studies on the experimental production of nephritis by Dickson and those of Pearce on the production of œdema in nephritis so produced are carefully described and their practical importance is indicated. The subjects of orthostatic albuminuria, pyelonephritis, and persistent hæmaturia are also reviewed at some length. 3. The Surgery of the Extremities, Shock, Anæsthesia, Infections, Fractures and Dislocations, and Tumours, by Dr. Joseph C. Bloodgood. This section contains interesting reviews of many recent papers on surgical subjects. The various methods of inducing local anæsthesia, including that of Bier, are discussed. Fractures and dislocations are considered at some length. Some special forms of tumour are also discussed. 4. Genito-urinary Diseases, by Dr. William T. Belfield. The treatment of gonorrhœal conditions by serums and vaccines, the use of tuberculin in renal tuberculosis and of vaccines in the treatment of infections of the bladder by the colon bacillus are reviewed. Various papers on prostatic diseases and their treatment are referred to, and a further paper by Edebohls on Decapsulation of the Kidney is summarised. Dr. H. R. M. Landis contributes a Therapeutic Referendum in which much recent work is collated in regard to numerous drugs and other therapeutic agents. The volume as a whole is a useful and readable work of reference.

*The Journal of Physiology.* Edited by J. N. LANGLEY, Sc.D., F.R.S., aided in the selection of papers by numerous collaborators. Vol. XXXIX., No. 5, Dec. 23rd, 1909. London: Cambridge University Press. Price 4*s.*—The contents of this number of the *Journal of Physiology* are: 1. On the Refractory Period of Muscle and Nerve, by Keith Lucas, Fellow of Trinity College, Cambridge, with seven figures in the text. 2. The Hexone Bases from Egg-white, by H. G. Chapman, M.D., and J. M. Petrie, D.Sc., F.I.C., Mackay Fellow in Bio-chemistry of the Linnean Society of New South Wales. These experimenters find the amounts of arginin, histidin, and lysin present in 100 grammes protein of egg-white to be: arginin, 2·39 per cent.; histidin, 0·66 per cent.; and lysin, 3·19 per cent. 3. Note on Asphyxia in the Spinal Animal, by R. Kaya (of Kioto) and E. H. Starling, with five figures in the text. 4. The Active Principle of a Bini Spear Poison, by P. P. Laidlaw, from the Wellcome Physiological Research Laboratories. The poison appears to be strophanthin. 5. The Catalytic Oxydation of Guiac Resin by Metallic Copper, by Hector A. Colwell, M.B., from the Cancer Research Laboratories of the Middlesex Hospital. 6. The Mode of Action of Nicotine and Curari determined by the Form of the Contraction Curve and the Method of Temperature Coefficients, by A. V. Hill, M.A., Scholar of Trinity College, Cambridge. 7. The Effect of Temperature on the Dissociation Curve of the Blood, by Joseph Barcroft, M.A., B.Sc., Fellow of King's College, and W. O. R. King, B.A., Travelling Student of Sidney Sussex College, Cambridge, with four figures in the text. 8. Water Rigor in Frog's Muscle, by Edward B. Meigs, instructor in physiology, Harvard Medical School. This number also contains the Proceedings of the Physiological Society for Oct. 24th.

# New Inventions.

## A SWAB-HOLDER FOR THE POST-NASAL SPACE AND PHARYNX.

FORMERLY brushes were used for swabbing the throat, but since the advent of the aseptic age these have been largely discarded, for obvious reasons, in favour of cotton-wool swabs. In order that the pharynx and post-nasal space may be properly swabbed, the swab-holder must be correctly designed. 1. It must be easily sterilisable without damage to itself. 2. It must have a suitable curve. 3. It must firmly grasp the cotton-wool, and yet this latter must be easily detachable when required. 4. Its point must be so shaped and rounded as not to damage the soft parts. 5. It must have such a calibre as to pass into the post-nasal space easily and without force, and yet have rigidity associated with a certain amount of resiliency. 6. The handle must be of such a size and shape as to give a firm and satisfactory grip.




These points have all been well carried out by the Holborn Surgical Instrument Company, Limited, Thavies Inn, Holborn-circus, London, E.C., in accordance with suggestions from me.

W. H. KELSON, F.R.C.S. Eng.

## AMMONIUM CHLORIDE INHALER (VAPOROLE BRAND).

UNDER the name of "vaporole brand" Messrs. Burroughs, Wellcome and Co., of Snow-hill Buildings, London, have introduced an ammonium chloride inhaler, which may be commended for its simplicity and its effectiveness. As will be seen from the accompanying illustrations, it consists of (1) a T-tube attached to (2) a wide glass tube terminating in a mouth-piece. The T-tube may be called the "laboratory" in which are contained the reagents ammonia and hydrochloric acid respectively. Each reagent is present in a small sealed glass tube ("the vaporole") wrapped in a little sack. The ammonia vaporole, after the sealed tube is fractured by a smart blow, is placed at the end of the T-tube marked alkali, and it is immediately followed by the acid vaporole fractured in the same way and placed

FIG. 1.

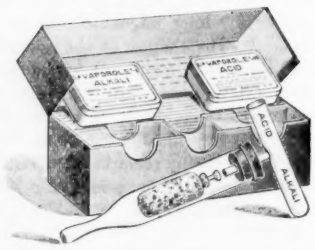
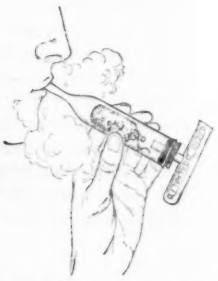



FIG. 2.



at the opposite end of the tube marked "acid." The sponge in the large tube is moistened with water which serves to blend the ammonia and acid and to wash and purify the ammonium chloride fumes produced. On drawing air through the apparatus it passes first over the hydrochloric acid, with which it becomes charged, and then meeting with the ammonia gas ammonium chloride is produced. The fume inhaled has the fineness and appearance of smoke and is entirely free from any irritating properties which might be due to an excess of one or the other gas. The apparatus is packed in a neat and compact case containing several vaporoles of the ammonia and acid.

## THE JOHN HERBERT WELLS FUND.

THE following is the tenth list of subscriptions to the John Herbert Wells Fund. Further contributions will be gratefully received by the Earl of Dalhousie and Mr. Julian G. Lousada, honorary secretaries and treasurers of the fund, at 16, Old Broad-street, E.C., or by ourselves at this office:—

| | £ | *s.* | *d.* |
|---|---|---|---|
| His Grace the Duke of Bedford ... ... ... ... | 50 | 0 | 0 |
| Lieutenant Frederick H. Lister, R.A. ... ... ... | 10 | 0 | 0 |
| Sir Thomas Barlow, Bart., K.C.V.O., M.D. | 5 | 0 | 0 |
| Her Grace the Duchess of Bedford ... ... ... | 5 | 0 | 0 |
| Lieutenant Owen Berkeley-Hill, I.M.S. | 5 | 0 | 0 |
| Pathological Society of Great Britain and Ireland ... ... ... ... | 5 | 0 | 0 |
| Mr. C. M. C. Shannon ... | 3 | 3 | 0 |
| Dr. J. B. Nias ... ... ... | 3 | 3 | 0 |
| Dr. Gwynne Lawrence ... | 3 | 0 | 0 |
| The Dowager Lady Broadbent ... ... ... | 2 | 2 | 0 |
| Dr. F. W. Andrewes ... | 2 | 2 | 0 |
| The Right Honourable Lord Ashburnham ... | 2 | 0 | 0 |
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| The Right Rev. the Lord Bishop of Brechin ... | 1 | 1 | 0 |
| O. W. L. H. (Malvern) ... | 1 | 0 | 0 |

## ADAMS *v.* POMEROY.

Dr. L. Garrett Anderson, 114A, Harley-street, W., honorary secretary of the fund raised to reimburse Dr. Martha Adams the legal expenses, amounting to about £100, which she incurred over and above the taxed costs in this action, acknowledges the following further subscriptions:—

| | £ | *s.* | *d.* |
|---|---|---|---|
| Mr. H. A. Ballance ... ... | 1 | 1 | 0 |
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| Dr. W. Domett Stone ... | 1 | 1 | 0 |
| Dr. George McIntyre ... | 1 | 1 | 0 |
| Dr. James Taylor (Tandragee) ... ... ... | 1 | 1 | 0 |
| Dr. John A. Adams ... ... | 0 | 10 | 6 |
| Dr. William Frier ... ... | 0 | 10 | 6 |

The total sum at present acknowledged is £56 4*s.* 6*d.*

# THE LANCET.

*LONDON: SATURDAY, JANUARY 15, 1910.*


## Jaundice of Obscure Causation.

THE functions of the liver, in spite of the very numerous researches which have been devoted to their investigation, still offer many problems for solution both to the physiologist and the pathologist. The glycogenic function and its study have been of great value, and its discovery by CLAUDE BERNARD was the precursor of the modern work upon the chemical inter-relationship of the various organs, which has led to such valuable advances as the discovery of internal secretions and hormones. The liver has no less important functions in regard to the metabolism of proteins and fats, although there are so many gaps in our knowledge of these subjects that it is difficult in any disordered condition of metabolism to assign the part played by the liver in its production, ready as the laity generally are to adopt this explanation of their digestive disabilities. The important and peculiar vascular relations of the liver, its large blood-supply, the well-established rôle it plays in the metabolism of waste blood pigment, and the influence which it appears to exercise in regard to coagulability all demonstrate its intimate relation to the maintenance of the normal and healthy state of the blood. In this connexion also the property which the liver appears to possess of neutralising certain toxins, whether of autogenous or extraneous origin, though as yet ill understood, is seen to be one of great importance. That the liver is very sensitive to certain toxic agents, the morbid histology of most acute fevers and of poisoning by many metallic and other substances amply demonstrates. Even in regard to the biliary function, which when deranged leads to such obvious effects, there is still room for much further information. This function is obviously closely related to that of blood destruction, and for long it was supposed that certain forms of jaundice originated directly from breaking down in excess of red blood corpuscles even in the absence of changes in the liver, such cases being referred to as hæmatogenous. It is now, however, generally conceded that jaundice is always of hepatogenous origin and that the absorption of the bile pigment into the lymphatics, and thence into the general circulation, is due to obstruction of the bile passages either of the larger ducts, as in the obviously obstructive cases, or of the intrahepatic bile capillaries, as in the cases formerly regarded as hæmatogenous in origin and now often referred to as toxæmic jaundice.

Jaundice and its associated symptoms form a group or symptom-complex which occurs in an almost bewildering variety of different conditions, as the list of causes of jaundice given in every text-book of medicine shows. In regard to many of these, more especially the obviously obstructive cases, the diagnosis may present no special difficulties, and well-established criteria exist for this purpose. On the other hand, the complex relations of the bile-ducts may render it difficult to establish whether the fault originates in them, in the liver, or in adjacent organs. In regard to toxæmic forms of jaundice, the difficulties are often much greater, and even after death the necropsy may fail, in the absence of exhaustive chemical and histological examination, to reveal the exact cause—indeed, the pathology of some of these forms is still under discussion. In particular a jaundice occurring during pregnancy may offer many difficulties, and we publish in this week's issue of THE LANCET records of cases illustrating these difficulties. The association of acute yellow atrophy with pregnancy is well known, and the characters which it presents render a toxic origin almost a certainty, the more so when its striking analogies with the results of phosphorus poisoning are borne in mind. The diagnosis in such cases is complicated by the fact that phosphorus is sometimes used, especially in Germany and Austria, by patients as an abortifacient. An interesting record by Mr. REGINALD G. HANN and Dr. R. A. VEALE of an unusual case of this kind appears on p. 163. The patient was a girl, aged 19 years, apparently two months pregnant, who took about a drachm of a rat poison containing about 4 per cent. of phosphorus. After a period of gastro-intestinal irritation, there was, as is frequently the case in phosphorus poisoning, a temporary amelioration of the symptoms, followed by the rapid development of the usual grave effects of hepatic derangement, leading to death within three and a half days from taking the poison. The interest of the case lies in the fact that in spite of the advanced fatty degeneration of the liver which resulted no jaundice occurred, and also in the occurrence of enormous subcutaneous hæmorrhages, as well as extravasations into the mediastinal and retroperitoneal tissues. Mr. HANN and Dr. VEALE suggest that the absence of jaundice may have been due to death having occurred too early for its development, but it is usually in the mild cases that it is delayed. Some hæmorrhage is, of course, common, but extensive subcutaneous hæmorrhages are rare. The other case, recorded by Dr. G. FULLER ENGLAND and Mr. FRANCIS R. THORNTON (p. 160), is one of jaundice occurring during pregnancy, and presents some peculiar features. The patient was a pregnant woman, aged 28 years, who, being seized with abdominal pain and vomiting, passed within two hours into an eclamptic condition, with fits resembling uræmic convulsions. The urine, obtained by catheter, was found to be claret-coloured and to contain albumin and blood. Further investigation revealed the presence of sugar and of methæmoglobin to which the colour was due. Red blood corpuscles were present in moderate numbers, and a few granular and hyaline casts. The case was therefore regarded as one of eclampsia with acute nephritis. Next day, however, on examination of the patient in daylight, the face and body were noticed to be markedly icteric, the conjunctivæ were œdematous and exuding a bile-stained serous fluid, while blood oozed from the lips. Labour had been induced on the previous evening, and shortly after midday a recently dead fœtus

was delivered; it was not bile-stained, though the placenta and membranes were. The patient died the same evening. At the necropsy the liver was found to be enlarged and to weigh 64 ounces. It was yellowish-red in colour and mottled in appearance. On section it was firm and not greasy, and on microscopical examination only very small areas of hæmorrhage and necrosis were discoverable, the widespread necrosis usually found in acute yellow atrophy being absent. The kidneys presented a definite early tubal nephritis. The diagnosis in this case offers many difficulties, even with the information brought out at the necropsy. The obvious possibility of phosphorus poisoning analogous to the case just considered was negatived by the absence of indications of irritant poisoning and by the failure to find phosphorus or its oxides in the gastric contents. The diagnosis of acute yellow atrophy, though highly probable when the clinical features alone are considered, is not conclusively established by the post-mortem investigations, and fails to account satisfactorily for the very marked urinary changes and the methæmoglobinuria. On the other hand, it must be confessed that acute yellow atrophy is a condition which both from the clinical and pathological standpoints is not sharply defined. It is now generally admitted to be the result of a profound toxæmia, of as yet unrecognised causation, and it is therefore readily conceivable that in a given case the toxæmia, while giving rise to very extensive hæmolytic changes and to eclampsia, and inducing early necrosis in the liver and kidneys, might prove fatal before sufficient time had elapsed to permit of the marked autolytic changes in the liver usually found in acute yellow atrophy. The clinical features and the pathological changes produced might, in other words, conceivably depend upon the virulence of the toxin and upon the organs upon which its main stress fell. Some such hypothesis has been put forward in regard to the three conditions—toxæmic vomiting of pregnancy, eclampsia, and acute yellow atrophy—by STONE, MACDONALD, EWING, and WOLF, who regard them if not as one and the same disease with different manifestations, at any rate as pathologically very closely related. These views are skilfully discussed by Dr. ENGLAND and Mr. THORNTON, and they regard their own case as going far to prove this contention. It is difficult to resist the conclusion that the fulminating toxæmia in their patient led to a condition which was in effect a combination of eclampsia and acute yellow atrophy. It is to be hoped that further chemical and perhaps bacteriological investigation of similar cases will throw more light upon them, and meanwhile careful records of any showing unusual features form a valuable and often suggestive addition to our knowledge.

Another obscure and interesting form of jaundice is that to which Dr. F. J. POYNTON draws attention in an instructive lecture which we publish on p. 153. The various names of congenital family cholæmia, family acholuric jaundice, and recurrent familial jaundice have been applied to it. The special features of this form are admirably illustrated by the three cases which Dr. POYNTON records and are, briefly, the occurrence of jaundice at birth and at intervals afterwards, the association of enlargement of the spleen, and certain blood changes leading to definite anæmia. During the attacks of jaundice the liver enlarges also. Though such patients are often undersized and delicate, as in Dr. POYNTON'S cases, they may live to adult life and bear children, as the family history demonstrates. Pregnancy in one of these cases coinciding with an attack of jaundice might lead to difficulties in diagnosis, and in a case recorded by Dr. CLAUDE WILSON the patient died from jaundice during pregnancy. Dr. POYNTON'S cases were investigated with modern hæmatological methods by Mr. D. EMBLETON, who found that the red corpuscles were unusually fragile as tested *in vitro*, but that the serum had no hæmolytic power. The view which Dr. POYNTON regards as best explaining the phenomena of this disease is that of MINKOWSKI, and HAWKINS and DUDGEON that the primary change is in the blood-forming organs and that the fragility of the corpuscles is the cause of the jaundice. The general theory is that this condition is a congenital family defect rather than an acquired disease. It is of interest to note that other forms of congenital jaundice of a family type are known, such as the cases described by Dr. JOHN THOMSON, these, however, often proving rapidly fatal. It is desirable that all cases of obscure family affections should be put on record and the genealogy given according to the recognised methods. In another column Dr. A. ROWLEY MOODY describes some family cases of Friedreich's ataxia with some interesting features; and, no doubt, if large statistics of family affections can be collected, much useful information will be eventually elicited.

## The Folklore of Menstruation.

ARE women during their menses centres of mysterious infection, and, as such, should they be allowed to handle articles of food designed for human consumption? Should they be allowed to act as nurses? We learn from a letter in the *Medical Press and Circular* that butchers' and bakers' salesmen are at all times averse to having their wares handled by women, but we do not think this proves much. This aversion may be due to the unwillingness which a shopman with a poor and inquisitive *clientèle* feels to seeing his wares pulled about. On the other hand, it may have a venerable folklore origin. The lore of the shop and of the household has been little examined and is rarely viewed in its racial and historical connexions. That women during menstruation have in all ages and climes been regarded in a hostile light is a commonplace of anthropology. Old-fashioned Wessex and Worcestershire countrywomen, for instance, believed, and perhaps still believe, that when in this condition they ought not to handle raw meat for fear of spoiling it. German peasants, in the same way, believe, according to PLOSS (*Das Weib*, 1884), that a menstruous woman entering a cellar turns the wine of the Fatherland to a sourness, and that if she cross a field she spoils the growth of young vegetation. The humbler class of Jewesses are accustomed to signal their menstrual condition to their husbands by a curious ritual observance. They tie bows of blue ribbon to their beds or chairs. The colour blue is here probably reminiscent of purple or blood-red. Similarly certain negresses in Africa wear a scarf of glaring colours folded three-cornerwise over the bosom during the menses.

Along the Congo the "house of blood," a hut daubed or marked with red, is used for the purpose of segregating the tribeswomen of each village when in this condition.

The Bible is explicit on the subject of menstruation, though it shows a delicacy, probably prompted by no idea of modern modesty, in mentioning the word. Indeed, the word "menstruous" only occurs some three times in the Scriptures, and then it is used by the Prophets, whose influence to some extent must have depended upon a deliberate contempt for euphemism. "Jerusalem is as a menstruous woman among them," says Jeremiah, and Ezekiel defines the just man as one who, among other things, has not come near a menstruous woman. The Books of the Law refer to the condition in periphrases, which were probably dictated by the early Hebrew's dread of mentioning an unlucky subject. "Issues" and a "time of separation" for women, as for men, are dealt with at length in Leviticus xv. The wording of the chapter suggests venereal disease, but in the case of women it is held to refer to the menses. The menstruous woman was held to be unclean for seven days, at the end of which she sacrificed turtle-doves as a sin and burnt offering. Coitus at such a period was a very grave offence. In ancient Persia the persons guilty of it were devoted to the fires of Hell until the Day of Judgment. The Zend-Avesta is full of regulations tending to isolate "unclean" women, and metrorrhagia is condemned as a crime to be visited with 100 strokes of the lash. The feeling was kept up in the East under Mahommedanism, and is found in Turkey at this day. Among the early Christians we find the same idea, for the Councils of Nice and Laodicaea in the fourth century refused the Communion, and even entry to the church, to women in this perfectly natural condition. Heathen antiquity in Greece and Rome was full of superstition with regard to the menses, and we need only quote PLINY who believed that a menstruous woman walking through the fields before sunrise kills noxious insects, while after the sun is up she exerts a withering effect on green corn and young vines. Her presence rusts razors, dulls mirrors, and causes abortion. The Middle Ages improved on all this. The menstrual fluid was held to generate vipers and vampires, and, conversely, it possessed medicinal qualities. Among savages all these beliefs flourish in crude forms. Everywhere there is the idea of uncleanness and of the necessity for isolation. This is so among the South Sea Islanders, the negroes, and a variety of other races. We may here mention the New Caledonians, who, like the Congo natives and indeed the Persians, set apart a special place for the segregation of the affected.

Pseudo-hygienic motives for the treatment of females during their "separation" cannot always have prevailed. Primitive man, as indeed all primitive savages, doubtless regarded the menstrual flow as something mysterious and containing the soul or life-principle. We know that blood in general, semen, sputum, excrements have been so regarded. Colour is given to this theory from the fact that in the Middle Ages menstrual blood was held to cure *Geist-krankheiten*—epilepsy and hydrophobia. The customs of the herd may also have given rise to the attitude of the earliest men towards menstruation. It has been pointed out that whereas coitus only takes place among the lower animals during seasons of rut, among all human tribes such connexion is regarded with horror. Have we not here a survival of the customs of the herd, which, at some infinitely remote epoch, allowed coitus during the period of separation only to the patriarch while refusing it to the other males of the primitive human group. There can be no doubt, anyhow, that ritual segregation has during the ages been an immense handicap to the female sex, and from the physiological point of view the fact of menstruation must still have its influences. GOETHE pointed out that man and woman could not be properly termed equal while the latter had perforce to suffer from physiological disabilities, more or less severe, during many days of each year, and the dictum cannot be explained away. But sound physiologists would be the first to protest against the maintenance of the rubbishy and degrading superstitions to which we have alluded above.

## Tuberculosis in Childhood.

THE importance of a careful study of tuberculosis as it occurs in childhood cannot be exaggerated, and we have recently on several occasions drawn attention to the subject. In another column we publish an article by Dr. CLIVE RIVIERE under the heading "Phthisis in Children." In discussing the condition which he is describing Dr. RIVIERE alludes to the importance of clearness in nomenclature, and we agree that it is essential that there should be no confusion as to the terminology to be adopted. For many years all writers on diseases of the chest adopted the word "phthisis" as indicating a disease characterised by destruction of the lung tissue. Then a heated controversy arose as to the relation of tubercle to the disease, when certain conditions at one time included under the term "phthisis" were shown not to be of a tuberculous nature. Dr. J. KINGSTON FOWLER was one of the earliest to urge that the term phthisis should no longer be used when tubercle was present, because of the confusion which was associated with the word, and for many years we have employed the term "pulmonary tuberculosis" in its place. We consider that in so doing we are adopting a more exact expression, harmonising the affection of the lungs with tubercle occurring in other organs and tissues of the body. The nature of the disease as well as the organ affected is thus definitely indicated. The word "phthisis" is generally used according to the meaning given to it by Dr. RIVIERE—namely, "a chronic pulmonary tuberculosis of a type similar to that found in the adult"; but we do not follow his suggestion that when others use it "to cover all cases of tuberculosis of the lungs," they are any more or less correct. Dr. F. T. ROBERTS, in delivering the Lumleian lectures in 1902, said:[1] "I have employed the expression 'thoracic phthisis' advisedly to emphasise what are, in my opinion, two most important practical facts—namely, first, that in the cases of chest disease usually and conveniently grouped as 'consumption' the morbid changes are by no means limited to the lungs, but in the large majority of instances other thoracic

[1] THE LANCET, March 29th, 1902, p. 867.

structures are more or less affected as well, and the mischief may even originate in certain of these structures; and secondly, that, even assuming the disease to be essentially a manifestation of tuberculosis, other lesions and pathological changes may be associated with the tuberculous mischief from the first." Dr. RIVIERE'S definition of "phthisis" is not quite clear to us, but from his subsequent remarks we are inclined to the belief that he would not agree with Dr. ROBERTS. Dr. RIVIERE further remarks that it is much better never to use the term "pulmonary tuberculosis" when phthisis is meant, since it is obvious that used without qualification "it includes all forms of tubercular disease in the lungs." We see no reason for this objection; we consider that "pulmonary tuberculosis" should include "all forms of tubercular disease of the lungs," qualifying adjectives—miliary, caseous, or fibroid, and so on, being prefixed if necessary. We have dwelt on this subject at length, as we wish to emphasise the importance of avoiding, as far as possible, any ambiguity in scientific terms. Old fashions die hard, and it will probably be some time before the word "phthisis" disappears from modern medical literature, but the arguments that have been raised in favour of the more scientific term "pulmonary tuberculosis" are, we contend, much stronger than are those for the retention of the older expression.

In referring to the channel of infection in childhood, Dr. RIVIERE makes it very clear that, in his opinion, the digestive tract plays an important part, bringing forward the fact that the mesenteric glands are frequently the seat of a tuberculous adenitis. This view is now finding many supporters. Some authorities still hold the older theory—namely, that the respiratory organs are the first to allow the passage of the bacilli. Dr. L. EMMETT HOLT, in the last edition of his well-known work on the "Diseases of Infancy and Childhood," maintains that the most frequent source of infection is from direct association with persons suffering from pulmonary tuberculosis, and that infection by milk is relatively rare, and alludes to the frequency of tuberculous deposit in the bronchial lymph glands in support of this. Dr. RIVIERE, on the other hand, thinks that the affection of the bronchial glands is secondary to that of the mesenteric glands. Of course, dust-bearing bacilli emanating from dried sputum may be swallowed as well as inhaled, which fact would tend in a degree to reconcile the two opinions, but undoubtedly here is a matter upon which no one can as yet be dogmatic. Dr. RIVIERE also refers to the lamentable lack of statistics in this country respecting glandular tuberculosis in children. Why records of this nature have not been collected, or if they have been collected have not been made available for ready reference, it is difficult to say. Perhaps the chief reason is that for the figures to be of real value they must be derived from the post-mortem records of children dying from some acute disease having been previously in full health. The fever hospitals would be naturally the source from which such investigations might be derived, but, as is well known, necropsies are not always easy to obtain in this country, and in order to render such examinations of true value elaborate microscopical and bacteriological measures would be necessary. We would, however, suggest that all practitioners who meet with such cases should make a note of them so that in the future they might be published, and aid in adding to the statistical evidence of the occurrence of unsuspected gland disease. For diagnosis is of the first importance, in which connexion Dr. RIVIERE refers to certain conditions which in children are liable to be mistaken for pulmonary tuberculosis. We agree with him that the interpretation of physical signs in children may present far more difficulty than in the adult, and the frequent absence of expectoration adds still further to the obstacles preventing a proper diagnosis.

Many interesting remarks on the statistics of tuberculosis are brought forward in the paper. It is generally accepted that no age is exempt from pulmonary tuberculosis, but Dr. RIVIERE shows very clearly that less than 4 per cent. of all cases of "phthisis" are found in children of school age. This would correspond, we believe, with the experience of most physicians attached to the chest hospitals, but nevertheless the existence of latent tuberculosis is always to be borne in mind. The importance of the general manner of life of the children must be urged on all those who are responsible for the management of schools. Latent disease may at any time become active owing to unhealthy surroundings. The ventilation of many schools—not only Board schools, though these are chiefly in question—still leaves much to be desired, and the responsibility of those in charge is proportionally great. Undoubtedly, if the school-rooms are rendered healthy, and the scholars are helped in other ways to live a life of "physiological righteousness," the incidence of tuberculosis in the young will be greatly lessened. Dr. RIVIERE'S paper is one more argument in support of the far-reaching influence for good which we may expect from the inspection of school children.

# Annotations.

"Ne quid nimis."

## THE GENERAL ELECTION.

A GENERAL election is an event which calls upon the members of any great profession, such as the legal, the medical, the naval or the military, to consider how far the special claims or interests of their own calling are either identical with those put forward by political leaders or are of a kind to require some particular efforts if their class is to be duly protected or advanced. In an election brought about in the ordinary manner, by effusion of time, this aspect of the general question before the constituencies is usually manifest and undeniable; and, although it may be less evident in one which has been precipitated by a political crisis, it none the less deserves and requires attention. But on the present occasion the main questions before the electorate have been so confused by the multiplicity of issues that it is impossible to obtain from most of the candidates and their leaders any definite reply to the inquiry, "What are we voting for?" Some lay stress upon the merits of the Budget, others on its demerits; some point out the unfitness of the House of Lords for the functions which the constitution calls upon it to discharge, others think that the assembly of peers makes

a decent second chamber; some put the advantages or disadvantages of a system of Free Trade in the front; and some consider the Home Rule question the most urgent. Generally speaking, it may be said that the constituencies are invited to open their mouths and shut their eyes and to wait in expectation of benefits which will presently descend upon them, while among the 25 medical candidates for Parliamentary honours are to be found Liberals, Unionists, and Home Rulers offering different things. This is what might be expected, for among the many thousand members of the medical profession in this country there are, of course, individuals of every shade of political opinion, many by whom the promises of the Ministerial party are accepted as current coin, many by whom the fulfilment of these promises would be regarded as a national calamity, and some who are as indifferent as Gallio to arguments and contentions which they believe themselves to see through, and in which they discover little but efforts to obtain place, patronage, or power, no matter at what cost to the real prosperity of the nation. We have every respect for sincere and reasoned opinions; and whereas it might conceivably, though a journal with no party politics, be within our province to discuss in general terms the relation which the questions of the day appear to us to bear to the profession to which we belong, in this election even that responsibility is removed from us by the confusion of issues before the electorate.

## FREAKS.

IN all lands and among all races love of the grotesque and the deformed can be traced back even to the earliest times as a notable trait in human character. The official attachment of dwarfs and jesters to royal courts and ducal houses in days gone by serves to illustrate this trait, while there is no doubt truth also in the remark of Gautier that supreme power has always loved to have supreme abjection beside it by way of antithesis. Innate morbid curiosity for the deformed has always been a characteristic of the popular mind, and popular inability to explain the occurrence of "freaks of nature" sometimes led to their being endowed with supernatural qualities, as witness the gods Bes and Phtah of ancient Egypt. Statuettes of these deities preserved in the Louvre reveal the familiar features of achondroplasia in an unmistakeable way. Exhibitions of human oddities have ever drawn curious crowds, a fact of which the late Mr. Phineas T. Barnum was fully cognisant. If the medical visitor to Olympia will spend half an hour in the happy and contented little community to be found at "Tiny Town" he will see much that is of interest. There he will have the opportunity of meeting and conversing with dwarfs of all sorts, and he will soon be convinced that many have qualities of mind out of proportion to their physical limitations. Several of the company are obvious achondroplasics, notably a mother and daughter of Swiss extraction, the former of whom informs us that she had a son too, who died in childhood, who was "very small," and in all probability suffered from the same disease. Similar heredity, therefore, seems to be established in the case of achondroplasia. Many of the other inhabitants of "Tiny Town" are undoubtedly instances of myxœdematous infantilism. Their smooth, round, somewhat puffy, pale hairless faces, their narrow eyes and pug noses, their shrill voices, their dull expression, their somewhat listless and lethargic and gestureless behaviour are easily recognisable. On the other hand, there do not appear to be any cases of true cretinism in the company. As far as one can judge by a superficial acquaintance with these examples of hypothyroidism at Olympia, a degree of mental infantilism coexists with the obvious physical maldevelopment. A further and numerous group, however, contains cases where mental development is more or less normal, to judge by the excellence of some of the stage performances, whereas physically the individual's growth has been arrested before it has passed that of the child. Such are really men and women in miniature, and some have developed secondary sexual characteristics in the shape of deep voices and hair on the face; others of the opposite sex have good heads of hair; but in practically all of them the head is broad and round and large in proportion to the rest of the body, thereby establishing a true infantile type. These little people, therefore, can scarcely be said to realise the picture of the seventeenth-century poet who sang of

> "Une mignonne incomparable
> Qui passait pour chose admirable
> Et ne pesait qu'un louis d'or."

The term "pygmyism" is restricted by the French to cases where the bodily proportions are perfect, though in miniature, and such appear to be extremely rare. Other well-known types of infantilism, among which may be mentioned the rachitic, the "pottique," in which the condition accompanies Pott's disease of the vertebræ, the anangioplastic (Lorrain's type, associated with defective development of the circulatory system), and the syphilitic, do not appear to be represented in "Tiny Town." It is desirable to remember that infantilism and dwarfism are by no means synonymous.

## DYSPEPSIA AND THIRST IN THE LIGHT OF OSMOTIC PRESSURE.

AN excellent and valuable illustration of the application of physical chemistry to medicine appears in a paper under the above title in the number of the *Bio-chemical Journal* issued on Dec. 29th, 1909. The object of the research, which was undertaken by Mr. Judah L. Jona, B.Sc. (Adelaide), of the Physiological Laboratory of Melbourne University, was to determine the osmotic pressure of the fluids ordinarily admitted to the stomach and at the same time to discover whether the sense of taste afforded us any guidance in the choice of fluids with reference to their osmotic pressure, more particularly as regards the rejection of the hypertonic, that term being applied to the liquid food or drink having an osmotic pressure higher than that of the blood, as distinct from hypotonic fluids which have an osmotic pressure lower than that of the blood. It is known that the lining cells of the mucous membrane of the stomach and intestine are injured by prolonged contact with a hypertonic fluid. The mucous membrane of the mouth is open to injury in this way, as is illustrated by the "roughness" produced when a piece of confectionery is retained for a few minutes between the teeth and cheek. It is also a matter of common experience that the intake of such substances as strong salt solutions, strong soups, and peptone solutions is followed by an irritable condition or revolt of the stomach. In the research alluded to the following substances were examined and their osmotic pressure at common strengths determined by observing the depression of the freezing point by Beckmann's cryoscopic method: (1) beverages: coffee, tea, lemon juice, beer, wine; (2) foodstuffs: treacle, peptonised milk, Benger's milk, soups (salted and unsalted), beef tea (salted and unsalted); (3) sugars: cane, dextrose; (4) fruit juices: lemon, orange, pineapple juice, cocoanut milk; (5) saline aperients: magnesium sulphate; a balanced saline aperient; and (6) saliva. The experiments showed that of all the fluid foods which are admitted to the stomach, alcoholic beverages and fruit juices alone are hypertonic. In no case, it would appear, is a fluid admitted in which hypertonicity is due to the mineral ingredients alone. It is

therefore concluded that when the kidney is found to be elaborating a fluid (urine) with sufficient saline ingredients to render it hypertonic, the high concentration of the fluid must be regarded as so much external work done and of sufficient moment to be taken into consideration in calorimetric experiments on an animal or on the human subject. The experiments further demonstrate that a distinct "osmotactic" character may be awarded to the sense of taste. The palate exercises a diplomacy and is potent in testing the food, not only qualitatively, but also from the quantitative standpoint of molecular concentration. Even those hypertonic fruit juices which are admitted to the stomach are passed, so to speak, under protest, for their taste is recognised as astringent or highly acid, and are apt to be followed by a sense of thirst. It is admitted, however, that the mechanism is faulty when dealing with alcoholic beverages—a fact which is possibly due to the artificiality of fermented liquors, and their manufacture and consumption being restricted to man only. The fact remains that the great majority of fluid foods are hypertonic, and thus a margin is left for the addition of hydrochloric acid and other constituents of the gastric juice. As regards alcoholic beverages it is pointed out that a solution of alcohol in pure water is tonic with blood would only be about 1·5 per cent. As this percentage is almost invariably exceeded in alcoholic drinks, and as other substances are present in addition, the high osmotic pressure of beer and wine is not surprising. As the author points out, the association of the raising of osmotic pressure of beverages with the induction of thirst is made use of in some departments of commerce by the salting of alcoholic liquors and the over-sugaring of summer drinks. In the case of cane sugar, a solution iso-osmotic with the blood would be about 11 per cent., whereas the fluid which reaches the stomach as the result of even the slow ingestion of sweetmeats, as exemplified in the process of sucking confectionery, is much higher than this, and accounts for the disagreeable after effects very often experienced after over indulgence in such delicacies.

## THE INDICATIONS FOR APPENDICOSTOMY.

AT the present time there is a large amount of diversity of opinion as to the value of appendicostomy. By some it is regarded as of very great value in a number of different conditions, but by others it is looked upon as useless or as little more than a passing fad. Dr. W. B. Russ has contributed to the August number of the *Texas State Journal of Medicine* a very interesting and important paper on the operation. We are indebted for the following account of this paper to the report published in the *International Journal of Surgery*. Dr. Russ finds many indications for appendicostomy. He thinks it useful in amœbic dysentery, mucous colitis, chronic constipation, tuberculous ulceration, and syphilitic ulceration of the colon; it is of use to fix and drain an ileo-cæcal intussusception, to prevent gaseous distension in resection of the ileum, to anchor the cæcum in cases of volvulus, to treat multiple papillomata of the large intestine, and cancer of the transverse colon; in enteric fever it may be used in place of rectal feeding; it will serve as a substitute for cæcostomy; it is of value in cases of auto-intoxication, acute hæmorrhagic colitis, pernicious anæmia, and diffuse septic peritonitis; it may serve as a substitute for appendicectomy in chronic appendicitis, and it will relieve some dangerous post-operative conditions. There is something to be said for the use of appendicostomy in most of the conditions mentioned, but we cannot help thinking that the writer is a little enthusiastic in his advocacy of the operation. He gives in his paper a number of suggestions which may prove of service to those wishing to undertake appendicostomy. They are as follows: (1) avoid rough handling of the appendix and its mesentery, and be careful not to destroy the blood-supply in breaking down adhesions; (2) if the appendix is much injured or its blood-supply doubtful, or if it causes too much tension to bring it up to the surface, or if its lumen is too small, or if it is found necessary to irrigate the lower end of the ileum, a cæcostomy is preferable; (3) fasten the cæcum firmly, but in a way to preserve the blood-supply; (4) if the meso-appendix is broad and thick a hole should be made between its vessels and the parietal peritoneum should be united through the opening; (5) the appendix, with its mesentery, should be placed in the upper angle of the wound, and if there is any risk of the compression of its blood-vessels by the fascia or the skin these structures should be notched and united so as not to exert pressure; (6) it is not necessary to bend the appendix in its course through the abdominal wall, for in most cases there is no risk of leakage; (7) when it is necessary to open the appendix at once it is best to bring the appendix out through a button-hole opening in the skin a little more than half an inch from the edge of the incision; (8) a catheter should not be left in the fistula, and it is important not to use a larger catheter than is absolutely necessary, otherwise gangrene or leakage may follow; and (9) care should be taken to place the appendix in an easy position. We have not seen any more whole-hearted praise of the capabilities of appendicostomy than this paper contains, and its teaching must be received with reserve. There is probably a future before the operation, but time will be needed to distinguish between the conditions in which it is really of benefit and those in which its employment can be replaced by more efficacious modes of treatment.

## DECEMBER, 1909, AT HOME AND ABROAD.

THE southern regions of Europe, considered as a whole, have, unlike this country, every reason to be satisfied with the climatical conditions prevalent last month. Compared with December, 1908, the temperature was low at nearly all the home stations represented in the table below and high at almost all those on the continent and in the islands of the Mediterranean. The greatest minus values were about 3° at the Scilly Isles and Torquay, and the greatest plus values 4° at Paris and 5½° at Florence and Berlin. A large portion of central and nearly the whole of Southern Europe entirely escaped the touches of severe weather that visited this country, and Berlin, which is generally much colder in December than the north midlands of England, was for once rather milder. The usual conditions were also reversed by Florence being milder than the Scilly Isles. At Paris the temperature was practically the same as in London. In actual warmth no resort could compare with Algiers, where the mean temperature for the month was as high as 60°, or about equal to that of July in the north of England. Its temperature was, however, forced up to summer heat for a time by a somewhat protracted visitation of the unpleasant sirocco, and the more moderate warmth of Palma, Malta, and Palermo was far more agreeable. The shaded thermometer recorded a temperature as high as 60° or above only twice at Florence and the Nice observatory, while at Biarritz it ascended to that point or above it on eight days, at Naples on 10 days, at Rome on 12 days, and at Lisbon on 13 days. In this country it was quite an exception for the shade warmth to exceed 50° except at the Scilly Isles. At the majority of the stations given in the table the diurnal range of temperature was small rather than large. At Scilly and also at Manchester it was only 7°, and it is worthy of note that the mean warmth of the nights at the isolated station was just equal to the mean warmth of the afternoons at the cotton metropolis. At Naples and Palermo the average

night had the same temperature as the average afternoon at several places on the south and south-west coast of England. Although there was a large quantity of precipitation either in the form of rain or snow in this country, as will be seen by the figures below, there was also a more bountiful supply of sunshine than during an average December; even the London (Westminster) record (29 hours) was more than twice the average. Most places in the south of Europe experienced many rainy days, but except at Lisbon, which received a share of the disastrous rains that were so general in other parts of the Peninsula, the actual quantity was less than in these islands, and in spite of occasional cloudy periods there was much more sunshine.

| — | Highest temperature. | Lowest temperature. | Mean maximum temperature. | Mean minimum temperature. | Mean temperature for month. | Mean range of temperature. | Number of days with rain. | Total fall in month. |
|---|---|---|---|---|---|---|---|---|
| | ° | ° | ° | ° | ° | ° | * | ins. |
| Scilly | 55 | 36 | 50 | 43 | 46·1 | 7 | 21 | 4·23 |
| Jersey | 56 | 30 | 48 | 39 | 43·5 | 9 | 17 | 5·13 |
| Torquay | 54 | 26 | 48 | 38 | 43·1 | 10 | 18 | 5·91 |
| Sandown, I.W. | 53 | 26 | 48 | 37 | 42·5 | 11 | 19 | 4·66 |
| Weymouth | 53 | 26 | 47 | 38 | 42·5 | 9 | 17 | 4·16 |
| Bournemouth | 53 | 22 | 48 | 35 | 41·5 | 13 | 19 | 4·50 |
| Brighton | 50 | 25 | 45 | 36 | 40·5 | 9 | 15 | 4·23 |
| Bath | 55 | 19 | 48 | 35 | 41·5 | 13 | 17 | 4·42 |
| Buxton | 50 | 15 | 38 | 29 | 33·5 | 9 | 19 | 9·35 |
| Harrogate | 52 | 17 | 41 | 32 | 36·7 | 9 | 22 | 5·16 |
| Manchester | 54 | 18 | 43 | 36 | 39·5 | 7 | 23 | 6·24 |
| Nottingham | 54 | 14 | 43 | 32 | 37·5 | 11 | 23 | 3·82 |
| London | 55 | 25 | 46 | 35 | 40·5 | 11 | 13 | 2·24 |
| Paris | 61 | 26 | 46 | 35 | 40·1 | 11 | 12 | 1·33 |
| Berlin | 52 | 21 | 41 | 31 | 36·3 | 10 | 10 | 2·41 |
| Brussels | 55 | 25 | 42 | 34 | 37·8 | 8 | 21 | 4·82 |
| Nice | 63 | 36 | 53 | 41 | 47·3 | 12 | 12 | 2·34 |
| Biarritz | 73 | 32 | 56 | 46 | 51·3 | 10 | 10 | 2·36 |
| Florence | 64 | 30 | 54 | 44 | 47·9 | 10 | 14 | 3·82 |
| Rome | 64 | 36 | 57 | 43 | 50·2 | 14 | 10 | 3·12 |
| Naples | 66 | 37 | 56 | 48 | 52·0 | 8 | 16 | 4·00 |
| Palermo | 75 | 37 | 61 | 48 | 54·2 | 13 | 3 | 0·24 |
| Malta | 69 | 47 | 62 | 53 | 57·4 | 9 | 11 | 2·02 |
| Palma (Majorca) | 73 | 39 | 62 | 47 | 54·9 | 15 | 6 | 0·75 |
| Algiers | 82 | 46 | 67 | 54 | 60·2 | 13 | 14 | 3·82 |
| Lisbon | 64 | 44 | 59 | 50 | 54·5 | 9 | 15 | 6·38 |

* A day with at least 0·04 inch.

## THE SOLUBILITIES OF URIC ACID AND SODIUM URATE.

WE have received a reprint of a paper published in the *Biochemische Zeitschrift*, Band xx., p. 190, by H Bechhold and J. Ziegler, containing some interesting observations upon the solubilities of uric acid and its salts. They find that at 37° C. the solubility of uric acid in ox serum, inactivated by previous heating to 58° C. for an hour, is 1 in 1925, but they were able to obtain a condition allied to supersaturation, which they refer to as "overfilling" (*überfüllung*), in which one part dissolved in 1100. The solubility of mono sodium urate, usually referred to as sodium biurate, they found to be much less—viz., 1 in 40,000. The solubilities in serum are therefore strikingly different from those in water, in which sodium biurate is the more soluble, 1 part being soluble in 665, whereas uric acid is only soluble to the extent of 1 in 15,500 in water at 37°. Normal sodium urate, they assert, can only exist in circumstances which can never occur in the body—viz., in strongly alkaline solutions. Dilution of the serum with water or with physiological saline solution hinders the precipitation of uric acid and sodium biurate. OH-ions (sodium hydrate) and H-ions hinder the separation of both substances from serum. Of the kations, potassium, lithium and magnesium hinder precipitation; on the other hand, sodium invariably promotes it, and ammonium usually does so. They also suggest that their observations show that the blood of gouty persons is often supersaturated with urates, and that the retention of these substances in the organism leading to a gouty paroxysm may be due to some condition causing a deposit of the urates from the supersaturated serum in the cartilages or elsewhere, comparable to the sudden formation of crystals in a supersaturated solution of a crystalline substance—e.g., hyposulphite of sodium. They suggest that if their observations can be applied with regard to the explanation of therapeutic agencies mineral waters containing potassium and magnesium should be beneficial, those containing sodium harmful. They attribute the more favourable effects of a vegetable diet over a flesh diet to the content in potassium and magnesium salts, whereas even with a flesh diet poor in purins greater quantities of ammonium salt are formed, and these are injurious.

## TRACHEOTOMY FOR FOREIGN BODIES IN THE AIR-PASSAGES.

Dr. W. F. Westmoreland of Atlanta, Georgia, has written in the November number of the *American Journal of Surgery* an interesting article on tracheotomy for foreign bodies in the air-passages, especially in children. It is based upon 53 successful cases which he has had under his own care. The most important point in the paper is his objection to the use of a tracheotomy tube when the operation has been performed for the presence of a foreign body. He insists strongly on the necessity for immediate operation in all cases in which a foreign body has passed into the air-passages, quite irrespective of the fact whether dangerous symptoms are present or not. A great deal of the difficulty of the operation of tracheotomy in young children depends upon the fact that during childhood not only is the space within which the operation must be performed extremely small, but also the trachea itself is of extreme narrowness. In a child under two years of age the distance between the cricoid cartilage and the sternum is only about one and a quarter inches in length. By the age of five the length has only increased to one and a half inches, and even by 10 years it is but little more than two inches. The narrowness of the trachea at an early age is not fully appreciated. Up to the age of two years it hardly exceeds a sixth of an inch in diameter, and even by the age of 10 it is still only one-third of an inch in diameter. We have mentioned already that Dr. Westmoreland does not employ any tracheotomy tube. He leaves the wound open and if anything further is required a silk stitch is passed through each edge of the tracheal section, so that by traction the tracheal wound can be opened fully. He prefers to divide the isthmus of the thyroid should it be in the way, tying each half. Should the foreign body during the operation become fixed in the glottis he finishes the operation and when the trachea is opened he blows air into the lungs through a female catheter, and in the five cases in which this has occurred in his own practice recovery followed in all. Should the foreign body be expelled at once he closes the wound at the same time if there has not been sufficient irritation or infection to produce pathological changes in the mucous membrane of the air-passages. If, however, though the foreign body is rapidly coughed out, there is much inflammation or infection present he prefers to drain for a while, leaving the incision open and dressing the wound with perchloride of mercury gauze. When the foreign body is not promptly expelled a similar dressing is applied,

and apparently in none of Dr. Westmoreland's cases was any operation necessary for removing the foreign body. The fact that in all the 53 cases on which he has operated a successful issue occurred is attributed by him to the early performance of tracheotomy, so that the probability of the occurrence of irritation and infection is reduced to a minimum. The series is excellent and reflects great credit on the operator.

## BLACK BREAD.

A CURIOUS fallacy has been going the rounds of certain political squabbling this week to the effect that the term "black bread" implies a kind of famine food, whereas in several civilised countries it is just as much the staple and normal article of diet as is our white loaf. There is very little difference between the nutritive value of the wheat and the rye loaf. In some respects rye presents certain advantages over wheat, and in others wheat may be better than rye. Rye contains a rather greater percentage of soluble carbohydrates than wheat but somewhat less gluten, although the total protein matters amount to the same in both flours. Chemical analysis shows very trifling differences of composition between the two cereals. One distinct advantage of rye bread is that it keeps fresh longer than wheat bread. Rye bread also has distinct laxative properties. Pumpernickel or whole rye bread is more laxative than Schwarzbrod, possibly on account of its relative coarseness of texture. It is an interesting fact that when once the flavour of rye bread is appreciated ordinary white bread seems monotonous because of its comparative tastelessness, and so it is common to find the rye-bread eater demand black bread whenever he can get it and in whatever country he may happen to be. The large consumption of rye bread indicates, indeed, that in the event of a shortage in the wheat-supply the breach could be repaired by the use of rye without hardship. The bodily needs would be met and without any offence necessarily to the gustatory susceptibilities.

## INTESTINAL WORMS AND BACTERIAL DISEASE.

THERE appears to be an increasing opinion that the presence of worms of one sort or another in the alimentary canal is liable to give rise upon occasion to certain forms of bacterial disease, including peritonitis and appendicitis. Intestinal parasites, it is asserted, are able to cause injury to the lining mucous membrane of the alimentary tract, and through this solution of continuity the bacteria which swarm in the lumen of the intestine, and which are comparatively harmless so long as they remain there, are enabled to gain access to the deeper tissues, where they may occasion pathogenic changes, often of a serious kind. These views have recently been set out and explained in a clear and interesting manner in a paper on the Relation of Certain Cestode and Nematode Parasites to Bacterial Disease, published in the *Journal of Economic Biology*, by Dr. A. E. Shipley, F.R.S., Reader in Zoology in the University of Cambridge. In this paper a description is given of a fatal epidemic of disease among rainbow trout caused by nematode worms, some of which had penetrated to the swim-bladder of the fish, apparently from the intestine through the intervening tissues. The swim-bladder of infected fish showed extensive invasion by intestinal bacteria, while the same organ in healthy fish was entirely free from such organisms. Reference is also made to the author's investigation of grouse disease, in which malady it is said a badly infected bird may contain thousands of threadworms, giving rise to inflammation and other changes in the cæcal walls. Dr. Leiper, we are told, has satisfied himself in this instance that the threadworm pierces the mucous lining of the alimentary canal, allowing the bacteria of the intestine to penetrate into the deeper tissues. Allusion is also made by Dr. Shipley to the occurrence of a species of Strongylus quadriradiatus in the intestines of pigeons which had died from an unknown malady reported by Dr. E. C. Stevenson of the United States Bureau of Animal Industry. There seems no reason to doubt that the intestinal walls of the pigeons were in this case pierced by the parasite, and that this permitted the passage of the bacteria from the interior of the bowel into the peritoneal cavity. Observations made in France have led some experts to maintain that such a perforation, made as a rule by Trichocephalus dispar, is one of the more common causes, if not the commonest, of appendicitis in man. Two years ago Dr. Shipley published a paper in *Parasitology* on a Cause of Appendicitis and other Intestinal Lesions in Man. In this he drew attention to a number of instances in which human parasites, even those of common occurrence, had caused discontinuity of the lining membrane of various spaces of the body, thus permitting access of intestinal flora into the adjacent tissues. Comparatively few children escape from harbouring intestinal parasites at one period or another. Some surgeons with experience in operating upon the vermiform appendix deny that worms are found in that organ when it is being removed. But against this it is contended that systematic examination of the appendix for this purpose is not habitually carried out; nor could this examination be regarded as satisfactory unless it had been conducted by someone with special knowledge and experience of intestinal parasites. Dr. Shipley points out that since modern scientific investigation has shown that an important part is played by insignificant insects, like gnats, flies, bugs, fleas, and ticks, in conveying pathogenic organisms through the skin of man, it is not unlikely that entozoa in our digestive organs may play a similar part to these biting ectozoa. Though "we cannot keep off tapeworms with mosquito netting, nor destroy threadworms with films of paraffin oil" yet we can, in Dr. Shipley's opinion, by the use of suitable medicaments drive these entozoa out of the body, and by care in selecting and cooking both our food and water materially hinder the access of their larvæ to the interior. Vermifuges were at one time regularly prescribed by the family practitioner; since this practice has fallen into disuse it is alleged that appendicitis has become more and more common. Entozoa are possibly more deadly than biting arthropods, for the latter are not always infected, but the former are at all times surrounded in the intestine by a constant supply of bacillus coli and other organisms capable of setting up pathogenic action as soon as they reach the deeper tissues.

## THE VENTILATION OF SHIPS DURING BATTLE.

ONE of the difficulties which will occur in battle is discussed in the *Archives de Médecine Navale* for December, 1909, in a paper by Dr. Bastier (Médecin de 1re classe de la Marine Française), medical officer of the battleship *Patrie*. He points out that the explosion of shells on board a ship will blow the air out of her and fill her with poisonous gases (carbonic oxide and oxides of nitrogen) which will for long hang about her in spite of her speed, and which the ventilating fans, if running, will carry into all the neighbouring compartments. So will the men working down below be suffocated, and the more surely the better ventilated in ordinary times is their place of duty. He further states that there were many such cases at Tsushima, especially on the Russian side. He therefore proposes that when a ship gets within the zone of fire all ventilating fans shall be stopped, except those for the stokeholds (these draw their air from the upper deck, be it noted), no ventilation at all being better than the supply of poisonous air, and he suggests that in

each compartment under consideration (ammunition rooms, dynamo rooms, &c.) a reservoir of compressed air be provided holding enough air under pressure to blow out that compartment three times successively, this air to be used during the active phases of combat, to be refilled in the lulls. He allows that this would mean more weight and less room, it would mean more trouble for the engineers and more complicated systems of piping, so it will be long before such a scheme obtains favour, but his proposal to stop the ventilating fans while the ship is being struck has much to recommend it. Still, the best way for a captain to secure satisfactory ventilation for his ship in battle is to make certain in peace time that it is his gunners who shall first hit the other ship, at the longest range, and the most frequently, and so spoil her ventilation first.

## THE LOCALISATION IN THE NERVOUS SYSTEM OF THE TOXINS OF DIPHTHERIA AND TETANUS.

AT the Société Médicale des Hôpitaux of Paris some interesting researches have recently been reported which throw much light on the pathology of diphtheria and tetanus. At a meeting on Oct. 15th, 1909, M. Georges Guillain and M. Guy Laroche communicated a paper on "The Physiological Pathology of the Diphtheritic Paralyses." Clinical experience and experimental researches have shown that the paralyses of diphtheria frequently are in relation with the place of formation of the toxin from which an ascending neuritis starts. A man, aged 23 years, was admitted into hospital suffering from diphtheritic angina of malignant appearance on August 20th, 1909. Under antitoxin treatment he recovered and he left the hospital after some days. But on the 28th he noticed that he had some difficulty in deglutition and that his voice had a nasal twang. On Sept. 2nd he vomited and on the 3rd he was readmitted. He was pale, had a leaden tint, and appeared to be in a profoundly toxic state. There were complete bilateral paralysis of the soft palate, paralysis of accommodation of the left eye, hiccough, and dyspnœa. The pulse was soft and irregular and the heart sounds were muffled. The temperature was not elevated, but there was albuminuria. In spite of an additional injection of antitoxin and cardiac tonics vomiting occurred, the hiccough increased, the pulse fell to 44, and death occurred on Sept. 4th. At the necropsy macroscopic examination of the nervous system showed nothing abnormal. The liver showed yellowish ecchymotic spots and the kidneys points of hæmorrhagic nephritis. The medulla and cervical cord were removed and washed for 24 hours in running water to exclude the possible action of any toxin contained in the blood. With a sterilised scalpel the portion of the medulla containing the nuclei of the vagi was removed, broken up in a sterile mortar, and mixed with an equal volume of normal saline solution. A quarter of a cubic centimetre of the emulsion was injected into the cranium of a guinea-pig, and death occurred on the following day. Half a cubic centimetre was injected into the peritoneal cavity of another, and death supervened in 30 hours. Half a cubic centimetre was injected subcutaneously into a third, and death followed in 72 hours. At the necropsies no trace of infection was found and the blood was sterile. On the other hand, an emulsion similarly prepared from the cervical cord and the anterior pyramidal region of the medulla produced no effect on guinea-pigs. These experiments prove that a certain part of the medulla contained toxins, while other parts of the nervous system did not. Was the toxin of diphtheria fixed in the former? Fragments of the central nervous system were washed to remove the blood and placed in contact with the toxin of diphtheria, pure and diluted to 1 in 10, 1 in 100, and 1 in 200 of saline solution, and kept at the freezing temperature for 16 hours. The fragments were washed in running water for 24 hours and then broken down in a mortar and mixed with an equal volume of saline solution. Intracranial injection of a fifth to a quarter of a cubic centimetre proved fatal to guinea-pigs. Control experiments made with nervous tissue not exposed to the toxin proved negative. It was thus proved that the nervous tissue can fix the toxin of diphtheria. Further experiments showed that the lipoid substances of the brain have a high power of fixing the toxin. Evidently in the case related the cells of the medulla, especially those of the nuclei of the vagus, were impregnated with the toxin of diphtheria. This communication suggested to M. Jean Troisier and M. Georges Roux to investigate whether the toxin of tetanus can be found in the masticatory nuclei of the fifth nerve. This they did in a case which they communicated to the society on Nov. 12th, 1909. A child showed symptoms of tetanus 14 days after a wound of the foot, and on the following day intense trismus with dysphagia, opisthotonos, and rigidity of the lower limbs. Convulsions occurred every instant, and death supervened at the end of the second day. Intracranial injections of an emulsion made from the upper part of the floor of the fourth ventricle containing the masticatory nuclei produced fatal tetanus in a guinea-pig, while injections made from the anterior ponto-bulbar region and the lumbar cord produced no effect. Metchnikoff has found the tetanus toxin in the spinal cord, but these experiments show that it has a special affinity for the masticatory nuclei and explain the early onset of trismus.

## A MERCURIAL LINE ON THE GUMS.

IT is accepted that the well-known blue line on the gums in lead poisoning is due to a deposit of sulphide of lead in the deeper cells of the epidermis and in large phagocyte cells in the connective tissue. Analogy suggests that in poisoning by other metals a similar line might be produced by deposition of the corresponding sulphide. In persons who have been taking bismuth or copper and whose teeth are decayed a livid line is occasionally seen on the gums; and in a child poisoned with tetrachloride of gold the late Sir Thomas Stevenson described a purple-black line at the junction of the teeth and gums. It might be suspected that in poisoning by mercury the sulphide, which is a black insoluble salt like the sulphide of lead, would be deposited in the gums, producing a dark line. In a recent number of the *Progrès Médical* Dr. G. Milian has described, apparently for the first time, such a line. In a case of slight mercurial stomatitis he observed throughout both jaws, but especially opposite the incisor teeth, a violaceous-grey line 1 to 2 millimetres thick on the gums at the insertions of the teeth. The line followed the undulating margins of the gums and passed between the teeth. It was absent where the teeth had been lost. Dr. Milian finds that this line occurs especially in mouths which are well cleansed in order to prevent stomatitis. In stomatitis of medium intensity it sometimes occurs, but only in an incomplete form; at the less inflamed parts of the mucous membranes deposits are seen passing between the teeth. Once formed the line is very persistent; it may last several months in spite of careful treatment and the cessation of the administration of mercury. Dr. Milian thinks that this persistence points to the conclusion that there is a deposit of metallic particles and not simple pigmentation. It is curious that this line does not appear to have been previously observed. It seems to be very rare, which may be due, we suggest, to the increased circulation produced by the stomatitis being unfavourable to metallic deposition. The facts that it occurs in a complete form only in cases of mild stomatitis and in an

incomplete form in moderate stomatitis bear out this hypothesis.

## FLAME AND OZONE.

THOSE who are familiar with test-tube experiments in the chemical laboratory may have observed that when a tube containing cold water is placed in the flame of the Bunsen burner, or, better still, in the fierce flame of the Kern burner, a smell strongly resembling ozone is noticeable when the tube is removed quickly from the flame. When the liquid gets warm the phenomenon ceases. The subject has been studied more recently with the view of obtaining definite results, and there appears to be little doubt that ozone is invariably present in flames. In the case of the hydrogen flame the presence of ozone is proved by the action of the flame on silver. A vigorous current of hydrogen is ignited at a narrow jet and only the point of the flame is used to touch the silver. A black film of oxide is produced which is most intense where the silver is in contact with the hottest zone of the flame. Ozone is not found outside the flame for the simple reason that it breaks down in its passage through the zones of relatively low temperature. Therefore, from a practical point of view, intense flames would hardly serve the purpose of producing ozone, nor can it be supposed that the presence of intense flames in a room can be a source of ozone sufficient to be a means of removing the impurities of the air by oxidation. The ozone and in some cases hydrogen peroxide are merely an effect of the high temperature of the inner zones of a very hot flame. In some cases the ozone may escape being decomposed, as by blowing a strong current of air through a tube into the flame of an ordinary Bunsen burner. It is an interesting fact that ozone is produced by ultra-violet rays, and the hot flame of an atmospheric burner working under perfect conditions is rich in these rays. The ultra-violet rays are probably the source of ozone in nature, the rays themselves, of course, owing their origin to the sun.

## SPONTANEOUS RECOVERY FROM STRANGULATED HERNIA.

SPONTANEOUS recovery from strangulated hernia must be very rare. In the *Boston Medical and Surgical Journal* of Nov. 18th Dr. C. W. Stodder has reported the following case. He was called to a married woman, aged 59 years, a "Christian Scientist," on Oct. 17th, 1908. She was in considerable pain, which she referred to the right side, and had vomited constantly for two weeks, during which the bowels had not acted. In the right inguinal region was a tender œdematous, slightly tympanitic tumour. The patient stated that there had been a lump in this region for 18 months which had caused much discomfort, especially after hard work. She had always been constipated. In August the lump was very tender and the bowels did not act for ten days, during which she vomited constantly. The attack gradually subsided and the bowels began to act with frequent bloody discharges for nearly a week. Strangulated hernia was diagnosed and immediate operation was recommended, but the patient declined. On the morning of Oct. 19th a small gangrenous area of about the size of a ten-cent piece was seen; in the evening it had enlarged to the size of a quarter dollar. On the 20th the whole tumour was gangrenous and moist and had a fæcal odour. Dr. Stodder made an incision and opened a fæcal abscess, which was very offensive and discharged freely. Subsequently the tissues sloughed down to the muscles and a cavity 4 inches long and 1½ inches wide was formed. At its lower part was a knuckle of intestine of about the size of the first phalanx of the thumb and bright red which Dr. Stodder reduced into the abdominal cavity, causing considerable pain. The temperature was subnormal and the pulse was 100 to 120 for two weeks. The cavity slowly filled by granulation. On Nov. 15th gas was passed per anum for the first time since the attack. On Dec. 3rd an enema was administered and part of the fluid came through the fistula. On the 9th there was a large mass of fæces in the rectum which the patient could not pass. It was therefore broken up and removed digitally. At times much bile was discharged through the fistula, but very little undigested food. On Jan. 10th, 1909, there was diarrhœa, and some of the discharge came through the rectum. On the 15th, three months after the onset, fæces were passed normally per rectum. The patient declined an operation for closure of the fistula. The bowels acted naturally and the fistula gradually healed. In August the scar reopened after the patient had lifted a pail of water and discharged for two weeks. It then rehealed. The patient is now quite well and has no pain or discomfort.

## FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE.

THE Far Eastern Association of Tropical Medicine, which has been established to bring together workers in Eastern tropical medicine for exchange of ideas and to foster the spirit of scientific investigation, has decided to hold its meetings every other year, and the first will be held under the presidency of Dr. Paul C. Freer from March 5th to March 14th, 1910, at Manila, P.I., the final week being spent at Baguio in the Benguet mountains, the summer capital of the Philippine Islands. The sessions will deal with protozoology and helminthology; cholera, plague, and leprosy; surgery, obstetrics, and diseases of children; fevers in the tropics, including malaria and typhoid; dysenteries and beri-beri; tuberculosis; climatology, hygiene, and sanitation; and there will be a business section. A number of prominent medical men have signified their intention to be present and others have promised to send papers. Members of the congress are requested to bring with them, when convenient, rare pathological specimens, and unidentified helminthological or other specimens, for demonstration and discussion. The sessions at Manila will be held in the new building of the Philippine Medical School on Calle Herran, near the Bureau of Science and the new Government hospital. The session in Baguio will be held in one of the Government buildings. The Government has appropriated a liberal sum for the entertainment of the guests during the meeting. There will be evening entertainments and visits to points of interest in Manila. Those interested in ethnology and anthropology will have an opportunity of observing the Igorot people, a tribe which has had as yet but little contact with the white man, and has preserved most of its old habits and customs. The general secretary-treasurer of the congress is Dr. Francis Clark, Manila, Philippine Islands.

A PARLIAMENTARY paper has been issued containing an exhaustive report by Sir Henry Hesketh Bell, K.C.M.G., High Commissioner of Northern Nigeria and late Governor of the Uganda Protectorate, on the Measures Adopted for the Prevention of Sleeping Sickness since its Outbreak in Uganda.

A TELEGRAM from the Governor of Mauritius to the Secretary of State for the Colonies has reported 19 cases of plague with eight deaths during the week ending Jan. 6th.

# OBSERVATIONS ON THE CIRCULATORY SYSTEM.

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## III.[1]

### *Vascular Tension.*

THE term tension, as applied to the blood-vessels, signifies the degree to which their walls are rendered tense or taut by the application of a force tending to stretch them either longitudinally or laterally. The more extensile a tissue the less is it rendered tense when elongated to a given extent; the highly extensile normal lung cannot by the deepest inspiration be made as tense as the much less extensile fibroid lung of chronic phthisis, in which disease, as I have shown, the comparatively unyielding lung tissue is maintained in a state of supernormally high tension by the vigorous action of the inspiratory muscles, ever striving to increase the mean size of the chest, and thus, at one and the same time, to enlarge the breathing area and to minimise the resistance opposed to the right heart.

When an elastic tissue is made tense by being stretched it may be said to be in a state of *elastic tension*, a variety of tension which differs from that of a non-elastic substance in that it is capable not only of passively transmitting force, but also of actively manifesting it by recoil. As I suggested in the last section, it is possible that the condition of muscle in the state of contraction is essentially one of elastic tension, the shortening caused by contraction being of the nature of an elastic recoil.

The blood-vessels are rendered tense in two ways[2]: (1) by being pulled upon from without; and (2) by being distended by the blood pressure acting from within.

#### 1.—*Traction from Without.*

This may take place both in (*a*) the transverse and in (*b*) the longitudinal direction.

(*a*) *Transverse external traction.*—A tug acting upon the exterior of the vessels at right angles to their long axis, thereby causing an increase in their circular tension and tending to dilate them, seldom occurs except in the case of the intra-thoracic vessels. These vessels (including not only the intra-thoracic vessels situated outside the lungs but also the intra-pulmonary vessels) are subjected to a constant external tug acting at right angles to their long axis, one which rises and falls with every expansion and contraction of the chest. We are in the habit of regarding this tug as a species of suction resulting from the negative pressure in the pleural sacs. It is true that the structures immediately circumjacent to the lungs are subjected to a negative pressure, since the pressure which the intra-pulmonary air exercises on them is lessened by the amount of the elastic tension of the lungs. The lungs may thus be said to exercise suction upon these structures, and I have myself suggested the term "pulmonary suction" in this connexion, but it must not be forgotten that the tug is essentially exerted by the elastic tension of the pulmonary tissue. It is true that in the case of these extra-pulmonary structures it is not direct, seeing that the lungs are not adherent to them. In the case of the intra-pulmonary vessels, however, the transverse tug which the pulmonary tissue exerts upon them is of a more direct kind, and is constantly tending to expand them. It is by means of this direct transverse tug that the capacity of the pulmonary circuit is made to increase with every inspiratory expansion of the lungs. Doubtless during ordinary breathing many of the capillaries and smaller veins of the lungs are collapsed, only to be opened out when the lungs expand beyond their ordinary size.[3]

(*b*) *Longitudinal external traction.*—Both the arteries and the veins, but especially the former, are too short, unless stretched, to extend along the whole of their course. This is proved by the fact that in the cadaver they are longitudinally stretched between, and tug upon, the structures fixing them, undergoing considerable retraction when severed. During life, however, this external tug is for the most part annulled by the longitudinal stretching resulting from the vascular distension caused by the blood pressure. It is manifest that whatever external tug may exist is borne by the structures fixing the vessels in their course (these consisting mainly of the collateral vessels); otherwise it would be entirely borne by the heart on the one hand and the capillaries on the other.

That in the cadaver the arteries are not long enough to extend along their entire course without being longitudinally stretched is well known. If a portion of an artery be resected it is found to shorten by about a quarter of its length as measured *in situ*. This shows that in the cadaver the vessel exercises a considerable longitudinal tug on the structures fixing it. But, as just stated, the arteries do not exercise a similar tug on these fixed points during life, for it has been shown that by so much as a given length of an artery shortens after its removal from the body, by that amount is it lengthened when subjected to an internal fluid pressure equal to that of the normal blood pressure (Ballance and Edmunds). Hence we must conclude that during life the longitudinal stretching of the arteries is mainly, if not entirely, brought about by the blood pressure operating from within, and only in a minor degree, if at all, by external traction.

Temporary longitudinal stretching of the vessels by external traction takes place during certain movements. When, for example, the head is inclined backwards and to one side the carotid and companion jugular of the opposite side are stretched, and doubtless one of the purposes served by normal tortuosity in arteries such as the facial and vertebral is to prevent them from being unduly stretched by the movements of the parts in which they are situated.

Another instance of temporary longitudinal stretching of arteries is that which takes place in the lungs during their inspiratory expansion.

It is obvious that when a vessel is tortuous, whether normally or as the result of disease, it cannot exert any external longitudinal tug. Whatever longitudinal tension such a vessel may manifest must be the result of its distension by the blood pressure.

How comes it that the arteries are made too short to extend along their entire course without being stretched out longitudinally? The explanation is presumably as follows. If when undistended by the blood pressure they were just long enough to cover their course without being longitudinally stretched, it would follow that directly they became lengthened by the longitudinal stretching due to the blood pressure they would become too long for their course, and would in consequence be thrown into curves or even tortuosities. We might therefore expect to find that the longitudinal stretching which an artery would manifest if undistended by blood (its anatomical stretching, as we may term it) is normally such that it is exactly neutralised by the stretching produced on it by the habitual blood pressure, the stretching being produced from within instead of from without. We know, as a matter of fact, that the arteries are more stretched than the veins post mortem, and it will probably be found that the degree to which the blood-vessels exhibit longitudinal stretching post mortem (as measured by the extent of their retraction after division) is in proportion to the amount of blood pressure they are habitually called upon to sustain.[4]

One of the effects of this anatomical stretching is that it tends to keep the longitudinal tension constant, no matter how much the blood pressure may fall below the average, for if the normal blood pressure exactly neutralises the anatomical stretching, it follows that directly the longitudinal stretching due to the blood pressure begins to fall below the normal, the anatomical stretching, comes into evidence, and becomes more and more pronounced as the blood pressure falls, until when zero point is reached anatomical stretching

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[1] Nos. I. and II. were published in THE LANCET of Jan. 1st (p. 48) and 8th (p. 121) respectively.

[2] I here leave out of consideration the effect on the tension of the muscular constituents of the vessel wall of their contraction. Quite apart from the influence of forces tending to *stretch* them, and thus render them tense, muscle fibres are by virtue of their contraction thrown into tension.

[3] I must not overlook the fact that the blood-vessels lining the respiratory tract are subjected to a direct negative pressure during inspiration, this negative pressure increasing in proportion to the rapidity and force of the inspiratory act and to the degree to which it is obstructed by narrowing of the respiratory passages.

[4] I should expect, for example, the femoral vein to exhibit greater retraction after division than the jugular vein, especially in young subjects.

alone remains. Only when blood pressure becomes supernormal does longitudinal stretching begin to increase beyond the amount of the anatomical stretching exhibited at zero pressure.

Such an increase in longitudinal tension tends to cause an increase in the normal length of the vessel and to throw it into curves and tortuosities, as we may sometimes observe in the temporal artery when the pressure in this vessel is temporarily augmented, e.g., during a cough. But a supernormal pressure by no means necessarily does this. Whether the walls of a vessel shall be lengthened out by the blood pressure, either transversely or longitudinally, largely depends upon the tonus of its muscular coat. An increase in the blood pressure within a vessel may, indeed, be accompanied by an actual diminution of its calibre, and I think there can be no doubt that the muscular elements can by their contraction prevent the vessel walls from yielding longitudinally also when the blood pressure becomes supernormal. How otherwise can we account for the fact that in the last stage of granular kidney the radial arteries, after being subjected to years of heightened blood pressure, may yet remain not only non-dilated but perfectly straight. In such cases they are found to be firmly contracted. So far as I know, there are no longitudinal muscle fibres in these vessels. Be this as it may, I can have no doubt that their muscle fibres must be so arranged that they can by their contraction prevent the vessels from undergoing lengthening in consequence of a supernormal blood pressure. Doubtless this must be one of the functions of the longitudinally disposed muscle fibres which are present in some of the blood-vessels.[5]

### 2.—*Pressure from Within.*

The pressure of blood within the vessels stretches them both longitudinally and transversely, causing longitudinal and circular tension, and it is this tension thus caused—notably, the circular tension—which the physician has in mind when he speaks of vascular tension. The influence of blood pressure on circular vascular tension is expressed thus: tension = radius of vascular lumen multiplied into the pressure ($t = rp$). Its influence on longitudinal tension is only one-half this ($t = \frac{rp}{2}$).

It will be seen that the larger the bore of a vessel the more does a given blood pressure render it tense. Thus, supposing the radius of the aorta to be 500 times that of a capillary, a given blood pressure, say, 100 mm. Hg, will cause the tension in the aortic wall to be 500 times greater than that in the capillary wall, a fact which is apt to be lost sight of. This consideration explains why the tension in the walls of an aneurysm increases with every increase in its size, and why the delicate pulmonary capillaries can resist rupture under a pressure which suffices to cause dilatation of the many hundred times the thicker right ventricle.

The minimum amount of internal pressure needful to burst the walls of a chamber is spoken of as its bursting pressure, and inasmuch as the tension in, or strain on, the walls of a chamber resulting from a given pressure within increases with its size, it follows that the bursting pressure diminishes with every increment in the size of the chamber. It is for this reason that the thickness of the walls of a boiler have to be proportionate to its size, and that the larger blood-vessels need to be more stoutly built than the smaller ones, quite independently of the amount of blood pressure they have to support. Thus, though the blood pressure in the veins is less than that in the capillaries, the walls of the former are very much thicker.

*Distinction between blood pressure and vascular tension.*—It will be seen from the foregoing that a distinction has to be made between blood pressure and vascular tension. This is the more necessary seeing that the term "blood tension" is sometimes employed synonymously with "blood pressure"—i.e., the pressure which the compressed blood exerts on the vessel wall, thereby stretching it and rendering it tense, a pressure which can be measured by noting the height to which the blood spurts from an aperture made in the vessel wall, or the height to which that fluid can lift some other liquid such as mercury or water. It is best to discard the term tension in this sense and to employ the less ambiguous term "blood pressure." The term vascular tension signifies the degree to which the vessel wall is rendered tense, either by the blood pressure within, or by a force tugging from without. It is therefore something quite distinct from blood pressure. Nor is it right to suppose, as some seem apt to do, that blood pressure and vascular tension are necessarily equal at any given part of a blood-vessel, for not only are the forces influencing vascular tension from without independent of the blood pressure, but, as we have seen, the influence of blood pressure on vascular tension varies considerably with the size of the vessel lumen.

*The effects of a longitudinal and transverse incision in the vessel wall compared.*—If during life a small longitudinal incision is made into an artery the sides of the opening thus made gape, forming a circular orifice. If, on the other hand, a transverse incision is made, little or no gaping occurs, and the blood escapes in a flat sheet. The same results are observed when the experiment is made on a portion of excised artery distended with water under the normal blood pressure (Balance and Edmunds). These different effects are, no doubt, partly to be accounted for by the fact that the transverse tension of the vessel wall is double the longitudinal tension, and, possibly, partly also by the fact that the muscle fibres being arranged for the most part transversely a longitudinal incision causes a more extensive division of them than does a transverse incision and thus a more pronounced gaping.

### *Varying Degrees of Tension and Slackness of the Several Tissue Elements Forming the Vessel Wall.*

It must not be supposed that the tissue elements of the vessel wall—muscle fibres, yellow elastic tissue, white fibrous tissue—are necessarily all equally tense or equally slack at one and the same time. Thus when an arteriole contracts so as completely to obliterate its lumen, its non-muscular elements are necessarily rendered slack, though the muscle fibres themselves are, by virtue of their contraction, in a state of tension. That the intima is rendered slack by marked arterial contraction is shown by the wrinkling of this coat observed post mortem; and it may be mentioned in this connexion that the plicated condition of Henle's membrane seen in ordinary microscopic sections may be obviated by adopting means (such as distending the vessel with melted paraffin) to prevent post-mortem contraction of the vessel.

It is necessary to point out here that a non-tense (= slack) tissue may be regarded as capable of assuming varying degrees of slackness. On the one hand, it may be so little slack that the slightest extension of it causes it to become immediately tense. On the other hand, it may be so crumpled up that the immediate effect of extension is to straighten out the tissue elements towards the neutral point between slackness and tension; and it is manifest that until this has been reached tension cannot be produced; in short, it is not enough to make a broad distinction between tension and non-tension. On the contrary, just as we distinguish between varying degrees of tension, so also must we distinguish between varying grades of non-tension or slackness. When, e.g., a non-contracted, empty bladder fills up, it first passes through successive phases of diminishing slackness until the neutral point is reached, and thereafter through successive phases of increasing tension. Similarly in regard to the veins: a considerable quantity of fluid has to be introduced into an empty venous system before the venous walls are rendered tense and a plus pressure is produced.

Let us now consider in some detail the variations in respect of tension and slackness which the different tissues constituting the arterial wall—muscular, yellow elastic, connective—may undergo at one and the same time.

Suppose the muscle fibres in the arterial wall to be in a state of non-contraction and the blood pressure to be at zero. It is obvious that the vessel wall will then be in a state of complete recoil, i.e., all its tissue elements will be slack—devoid of tension. They will not, however, all be in an equal degree of slackness. A little consideration will show, e.g., that the yellow elastic tissue will be less slack than the connective tissue. The former will, by its complete recoil, be brought into the neutral condition (that condition, namely, which can be converted into one of tension by the slightest elevation of blood pressure and consequent distension of the vessel), and the assumption that the connective tissue elements are reduced to the same neutral condition necessarily implies a limitation of the extensibility of the

[5] One would expect the vessels in the lower extremities, arteries as well as veins, to contain such longitudinal fibres. We have already seen (Section I.) that the latter vessels do.

yellow elastic elements to that of the connective tissue which is considerably less, and in this case the high degree of extensibility of the yellow elastic tissue would have no *raison d'être*. We must therefore conclude that complete recoil of the yellow elastic tissue causes the connective tissue to become slack considerably beyond the neutral point (see Fig. 3), to be crumpled to such an extent that while the

FIG. 3.

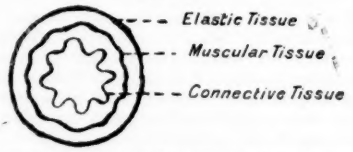


Diagram representing the relative degrees of slackness of the several tissues in a non-contracted artery in a state of complete recoil at zero blood pressure. (Note that the tissues, not the coats, of the vessel are represented in this diagram.) The elastic tissue is in the neutral condition—i.e., neither tense nor slack. The recoil of this tissue has reduced the calibre of the vessel to a degree which has caused the muscular tissue and the connective tissue to be slack. The muscular tissue is in a condition of moderate slackness. The connective tissue is in a condition of more pronounced slackness.

slightest elevation of blood pressure above zero will render the yellow elastic elements tense, a considerably greater elevation (with concomitant increase in the bore of the vessel) will be necessary to straighten out the connective tissue elements to the neutral condition.

It follows from this that the *tension in the yellow elastic tissue tends to be always higher than that in the connective tissue.* The high degree of extensibility of yellow elastic tissue would, I repeat, be rendered futile, serve no purpose, if it were reduced to that of less extensile tissues, and we may safely conclude that wherever yellow elastic elements are found they tend to be in a state of greater tension than that of the other component tissues. In the lung, e.g., the tension of the yellow elastic tissue must, under ordinary circumstances, be considerably higher than that of the other pulmonary tissues. It is probably only towards the extreme limit of inspiration that the tension of these other tissues approximates that of the yellow elastic tissue. If, as some physiologists teach, the lungs, even at the end of a complete expiration, still preserve some tension, we may be sure that it is limited to the yellow elastic elements, and that the other tissue elements are in a condition of considerable slackness.[6] I exclude from consideration muscle fibres in a state of tonus.

Just as, with complete recoil of a non-contracted artery under zero blood pressure, the connective tissue is rendered more slack than the yellow elastic, so also is the muscular tissue (see Fig. 3), for otherwise we should have to assume that the muscular elements in the arterial wall have in the non-contracted state as much power of recoil as the yellow elastic elements, which probably no one would contend. As to whether in such a case the muscular or the connective tissue elements are rendered the more slack, I am not prepared to say. Assuming that the latter are, then the order in which the three classes of tissue in the non-contracted artery would begin to become tense, as the pressure is increased from zero, would be as follows: yellow elastic tissue, muscular tissue, connective tissue; and by the time all three had been rendered tense their relative degrees of tension would be in the order mentioned, and this order would be maintained during sucessive increments of pressure up to a certain point, but not beyond this. Thus, inasmuch as the connective tissue—notably the white fibrous element—is less extensile than the yellow elastic tissue, a point must sooner or later be reached beyond which each increment of pressure would cause a greater augmentation of tension in the former than in the latter. When the limit of extensibility of the connective tissue is reached, this tissue will bear the entire brunt of any further increment of pressure.

The above considerations make it evident that the degree of tension or slackness in the various tissues constituting the arterial wall may show decided differences at one and the same time. Thus, so far as the elastic and the connective tissue are concerned, it is possible (*a*) for both to be tense (in which case the former tends to be the tenser of the two); (*b*) for both to be slack (in which case the connective tissue is always the slacker of the two); and (*c*) for the elastic tissue to be tense while the connective tissue is slack.

In the case we have just considered—i.e., that of the passive recoil of an artery with wholly relaxed media and under zero blood pressure—the lumen of the vessel is reduced to a certain size. Now firm contraction (hypertonus) of the media causes a further reduction in the size of the lumen, even to the extent, it may be, of complete obliteration (as may happen in the case of the arterioles). It is obvious that such extreme narrowing causes the yellow elastic and connective tissue elements to be far more slack than does mere passive recoil of the vessel: the yellow elastic elements instead of being in a neutral condition will be wavy and sinuous, while the intima will be thrown into pronounced longitudinal folds (see Fig. 4).

FIG. 4.

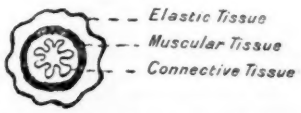


Diagram representing the relative degree of slackness and tension of the several tissues of a hypertonic artery of medium size. (Note that the tissues, not the coats, of the vessel are represented.) The vigorous contraction of the muscle fibres has so reduced the calibre of the vessel that both the elastic tissue, and still more the connective tissue, are rendered slack. The contraction of the muscle fibres, on the other hand, implies a condition of tension on their part, even under a zero blood pressure, and this tension of the muscle fibres will tend to increase with every increment of blood pressure; but no matter how high the pressure, so long as the tonus of the vessel can maintain the lumen of the vessel below a certain size, so long will the elastic and connective tissue elements remain slack.

The contracted muscle fibres, even when blood pressure is zero, will be in a state of tension, and this will increase with every increment of blood pressure. So long as the contracting fibres can maintain the vessel lumen at its minimum, or near its minimum, so long will the non-muscular elements of the vessel wall (elastic elements and connective tissue) remain in a state of extreme slackness, and this no matter how high the blood pressure is raised. In point of fact the muscle fibres are competent, in all but the larger arteries, to prevent, by their firm contraction, the non-muscular elements from being rendered tense even under the highest blood pressure. So long as they succeed in this, the media will firmly grip the intima and draw the adventitia after it. The latter will thus be wholly protected from the blood pressure, while the relaxed intima will be compressed between the media on the one hand and the blood on the other.[7]

The degree to which the muscular media influences by its contraction the tension (or slackness) of the non-muscular elements of the vessel wall depends, of course, upon the extent to which it causes a narrowing of the vessel lumen. This again depends partly upon the strength of its contraction and partly upon the degree of the blood pressure; the stronger the contraction and the lower the blood pressure the less does the lumen tend to be. If the muscular coat is well developed, as in the case of the arterioles, its vigorous contraction may prevent even a super-normal blood pressure from distending the vessel; but if, on the other hand, it is only moderately developed, as in the case of the large arteries, it may be powerless, by its most vigorous contraction, to withstand the distending effect of a high blood pressure. We may be sure that in the case of the aorta the most complete tonus of the media is incompetent, under an average aortic pressure, so far to reduce the calibre of the vessel as to render its yellow elastic elements slack, and thus deprive them of their essential function, which is to allow the vessel readily to expand under and recoil upon each successive wave of blood. I can conceive, however, that with a very low blood pressure hypertonus of this

[6] My own belief is that it is possible for those possessing a high degree of thoracic mobility to render the entire pulmonary tissue slack by means of a deep expiration.

[7] This is what generally happens in granular kidney, in the case of the smaller arteries at least, in which consequently the strain of the heightened blood pressure falls essentially upon the hypertonic muscle fibres. Hence in the vessels in question these fibres hypertrophy, while the adventitia not being subjected to increased strain often exhibits little change. Though the tension of the intima is not augmented it is subjected to increased pressure, and this may help to explain the hyperplasia it undergoes.

vessel might so far reduce its calibre as to render its yellow elastic elements slack, in which case the diastolic rebound would be effected by the muscular elements only.

Inasmuch as the extensibility of muscle is enhanced by its contraction, it follows that when in the living subject a fully relaxed arterial media enters upon a slight degree of contraction an increase in vascular lumen results. Whether, once the media has entered upon contraction, an increase in its tonus shall cause a diminution in vascular lumen or not depends upon the degree both of the tonus and of the blood pressure: the two may be so proportioned that an increase in tonus may lead to an increase in lumen. Arterial hypertonus, however, always causes a diminution in lumen, for though the extensibility of the muscle fibres of the media increases with every increment in the vigour of their contraction, the shortening produced by their vigorous contraction is greater than the lengthening caused by the distensile effects of the blood pressure.

It is probable that the degree of arterial tonus is often such (in some arteries, indeed—e.g., aorta—habitually such) as not only not to lead to any diminution in the vessel lumen but even to cause an increase of it. When, e.g., a maximum vaso-motor dilatation is called for, this is effected, not by a complete relaxation of the muscle fibres, but by a relaxation short of the maximum, since, as just stated, a slight contraction of the media allows the vessel to be distended by the blood more than does a wholly relaxed media, a consideration which makes it doubtful whether arterial tonus is ever completely absent during life.

In the case of the aorta the degree of tonus is such as to augment the extensibility and elasticity of the muscle fibres to the degree most favourable to the due expansion and rebound of the vessel. During ventricular systole and diastole a too pronounced aortic tonus might interfere with the proper systolic expansion of the vessel; an insufficient tonus might rob the muscle fibres of the requisite extensibility and elasticity. What is needed is just so much tonus as shall augment their extensibility and elasticity to the requisite degree, and this will vary with the blood pressure.

A question of some interest arises here. Is it possible that arterial tonus, say of the aorta, undergoes rhythmic modifications with the expansion and contraction of the vessel—that it is, e.g., *crescendo* during the expansion of the vessel and *diminuendo* during its rebound? This is, indeed, possible. I can well believe that aortic tonus increases towards the end of the systolic expansion, thus opposing a *crescendo* resistance to expansion, and saving the vessel from undue distension. If we suppose such a *crescendo* systolic tonus to occur during the expansion of the aorta, and if we further suppose the maximum tonus attained at the period of complete expansion to persist during the major portion of the diastolic rebound, it is obvious that the aorta would play not merely a passive, but likewise an active, part in driving the blood onwards. Be this as it may, it is certain that the muscular elements in the aorta are largely instrumental in determining by their tonus the peculiar extensibility and elasticity of this vessel; further, that by maintaining an active grip on the blood they play a large part in bearing the strain caused by blood pressure. They work, indeed, more unceasingly than the heart fibres themselves, for though it is possible that these latter preserve some degree of tonus during diastole, it is unlikely that such diastolic tonus is as marked as the aortic tonus in its moments of least development. Such considerations show how active must be the nutrition of the arterial media and how abundant its supply of blood.

While the vessel lumen may, as I have said, be greater with slight arterial tonus than with complete absence of tonus, every degree of tonus above the most moderate causes a diminution in the lumen of the vessel, and it is safe to say that in all but the largest vessels hypertonus causes a pronounced diminution even though the blood pressure be greatly supernormal. The total effect of the musculature in the systemic arteries is a considerable reduction in their total capacity—i.e., their average capacity is much less than it would be in the complete absence of arterial tonus. Hence it follows that the total effect of arterial tonus is very decidedly to relieve the strain on the non-muscular elements of the vessel wall, and that the greater the tonus of the muscular elements the more exclusively does the vascular strain caused by the blood pressure tend to fall on them.

*(To be continued.)*

# ANNUAL REPORT FOR 1908 OF THE MEDICAL OFFICER OF HEALTH OF THE ADMINISTRATIVE COUNTY OF LONDON.

## I.

IN the course of Christmas week the Public Health Committee of the London County Council issued its annual report submitting the report of the county medical officer of health for the year 1908. The present is the seventeenth annual report we have received from Sir Shirley Murphy, and, like its predecessors, it abounds with information of vital interest to everyone who has at heart the well-being of the vast population of the metropolis.

### *Coördination of Public Health and School Authorities.*

Adequate study of Sir Shirley Murphy's recent reports leads to the conviction that the system under which the interests of public health and of elementary education can best be secured, with due regard to economy as well as to efficiency, consists in the coördination of both these functions under the same representative authority. The arguments in the other direction are strong, but the plea of expediency is stronger. Our readers will remember that in connexion with the issue of the recent Education Act the Board of Education published a memorandum setting forth the official opinion concerning the relations that should subsist between the newly constituted education authorities and the authorities already in charge of the public health. The main principle which the Board declares to be essential to the development of administration on sound lines is, in the words of the memorandum, "That school hygiene cannot be divorced from home hygiene, and that this in turn is intimately bound up with the hygienic conditions of the community. Efficiency and economy require, therefore, an organic relationship between the daily work of the school authority and of the authority responsible for the administration of the wider branches of the public health."

In his report for 1904 Sir Shirley Murphy ventured to predict that the transfer to the County Council of the administration of the Education Acts would tend to bring the child population into proper relation with the health authority, and that by this means the spread of disease among susceptible persons of all ages would be diminished. Subsequent experience has undoubtedly justified this prediction, for statistics show that a higher standard of health has prevailed in London ever since the above date, not only among children, who are always the chief victims, but also among persons above and below school age. That the transfer referred to has been an important factor in this improvement is highly probable; and on that account it is encouraging to find that the County Council is proceeding consistently on the lines indicated by the Board of Education, notwithstanding that their responsibilities as well as their expenditure have naturally increased in at least equal proportion.

In the present report the subject-matter is arranged under definite headings. The first part relates almost exclusively to vital statistics; the second part to public health administration; whilst the third part, which is contributed by Dr. J. Kerr, abounds with instruction on matters of school hygiene.

### *Vital Statistics.*

In his introduction to Part I. Sir Shirley Murphy states that the year 1908 was exceptional in many respects, and particularly on this account that the statistical records show rates of birth and death as well as of marriage which are the lowest observed in any year since the establishment of civil registration. In that year the marriage-rate was equal to 15·9 only per 1000 of the aggregate population, and was below the average rate in the last completed decennium by 1·9 per 1000. The birth-rate was 25·3 per 1000, and the death-rate 13·8 per 1000 of the population estimated to be living at all ages and of both sexes, these rates being respectively below the decennial averages by 5·1 and by 2·9 per 1000. For several years past the Registrar-General has published periodical returns of marriages, births, and deaths for London, in common with other large towns. Nevertheless, for administrative purposes it is necessary to supplement this information by statistics in much greater

detail, relating not only to the metropolis as a whole, but to the separate sanitary districts under the jurisdiction of the Council.

In submitting his population estimate for the several metropolitan districts, Sir Shirley Murphy observes that although by the national method the death-rates are still calculated on the assumption that the rate of increase in the last decennium has since been maintained, the correctness of this assumption is open to doubt, in view of the fact that an interval of seven years has elapsed since the last Census. Accordingly, he has tabulated side by side with the rates thus obtained the rates calculated on the basis of the number of inhabited houses returned in each district under the Equalisation of Rates Act. From this table we learn that although the rates computed by the two methods for the county as a whole are practically identical, the difference in the case of certain of the metropolitan districts is very considerable. It should, moreover, be borne in mind that since the year 1901 the numbers as well as the age constitution of the local populations may have materially altered, and that for this change no reliable correction can be made until the figures of the next census are available.

In noticing previous annual reports of this series we have directed attention to the particular merits of the life table method as employed by Sir Shirley Murphy in estimating the effects on a community of fluctuations of mortality. The advantages of this method are enumerated in the county medical officer's report for 1901, which contains the London life table for that year, together with the mathematical formulæ employed in its construction. In a table in the present report the number of deaths occurring in 1908 at each age period is compared with the number that would have occurred had the death-rate of the period 1891–1900 been maintained in that year. The number of lives saved is also shown, and this is expressed in terms of "life capital"—the result being obtained by applying "the mean future life time," given in another table, to the number of lives saved at each group of ages. By this method it has been ascertained that, as compared with the decennium 1891–1900, there has been in 1908 a saving of 26,205 lives, representing a gain to the community of 1,066,770 years of life capital. From a table comparing the London death-rates in 1908 with the corresponding decennial rates it appears that the rate of mortality in that year was considerably lower than in the period 1891–1900 at each stage of life in both sexes, except at ages beyond the eighty-fifth year. In another table the corrected district rates are shown for 1908 in comparison with the average rates for the preceding quinquennium. From this table we see that in both periods Hampstead experienced the lowest death-rate, whilst the highest rate occurred in Shoreditch in 1908 and in the City of London in the preceding five years.

### *Infant Mortality.*

It will be remembered that the Duke of Devonshire's Committee on Physical Deterioration in its report issued five years ago commented severely on the absence of adequate official records of sickness and mortality among the infant population of this country. For more than a half century previous the reports of the Registrar-General had contained information respecting the mortality occurring in each trimester of the first year of life, but as regards the causes of loss of life in the first days and weeks after birth no information was at the time accessible, although this might readily have been unearthed from the national registers in Somerset House. Accordingly, a table was prepared by the committee's request showing in sufficient detail the causes of death in each week and month of the first year of life, and since the year 1904 a similar table has been required by the Local Government Board in the annual reports of all medical officers of health. By summarising these tables for the several sanitary districts of the metropolis the county medical officer is now able to give information on infantile mortality of a character which until recently has been unattainable.

Infantile mortality, as ordinarily computed, is free from the defects of the general death-rate, because it is based not on mere population estimates but on observed facts of birth and death. Consequently it has become general with expert sanitarians to appeal to the former rather than to the latter as a test of the sanitary condition of a community. It is satisfactory to learn that in the year 1908 the London rate of mortality of infants under the age of one year did not exceed 113 in each 1000 births—a rate which had never previously been recorded. In the present report a diagram is inserted showing the infantile mortality of London in each year of the last half century. The rates are also shown after exclusion of the deaths from premature birth, which would probably be affected in a greater degree than the deaths from any other cause, by the more complete registration of recent years. Both curves in this diagram show the mortality to have been lower in 1908 than in any other year since 1857. Among metropolitan boroughs the loss of infant life has for several years been greatest in Shoreditch and Bermondsey and least in Hampstead. Compared with the rates of other large English towns London experienced a lower infantile mortality in the last decennium than did any of these towns except Bristol. Another table summarises the returns of the district medical officers of health, and is drawn up in conformity with the instructions of the Local Government Board. From this table we learn that of 13,956 deaths within the first year of life occurring in the year 1908 as many as 4412 took place during the first month, of which number 2645 had not survived birth by more than seven days. From the first month until the twelfth the deaths diminished in number almost steadily.

Reviewing this interesting table Sir Shirley Murphy remarks that although London experienced in 1908 the lowest infantile mortality hitherto recorded, it needs to be remembered that this rate is liable to considerable fluctuations owing to climatic changes and varying degrees of epidemic prevalence. After quoting from the table the more striking instances of such fluctuations in the year under report he returns to the point that infantile mortality is extremely sensitive to influences that vary from year to year, for the effects of which administrative effort can as yet but imperfectly compensate. "Therefore," he continues, "the result of the efforts which are now being made to lessen infantile mortality must not be judged by the mortality of the moment. It is sufficient that these efforts should be rightly designed and properly applied, and there need be no feeling of doubt that when the accumulated experience of some years is available it will prove them to be of value. The difference between the rates of infantile mortality in districts well and in those badly circumstanced socially is sufficient indication of the results which might be obtained if the infants of the less favoured districts had extended to them the same care as that bestowed upon infants of the better favoured districts."

With the aid of a further series of tables, in which infantile mortality at several stages of the first year of life is shown in relation to social condition, we detect a marked difference when the least overcrowded are contrasted with the most overcrowded districts, the term "overcrowding" being understood to apply to that portion of the population living more than two in a room. Strangely enough, the difference is greatest, not among infants within three months of birth, but among infants aged from 9 to 12 months, and at the latter ages the mortality in the most overcrowded districts exceeds that in the least overcrowded by from 80 to 85 per cent.

### *Preservation of Infant Life.*

Among systematic efforts now being made in the metropolis for the preservation of infant life Sir Shirley Murphy speaks appreciatively of the system of visitation by female sanitary inspectors or health visitors. This system was originated many years ago by the Manchester and Salford Sanitary Association, which is still doing admirable work in those Lancashire boroughs. The London County Council (General Powers) Act of 1908 provides for the appointment of female health visitors and enables the Council to contribute to their salaries, and we gather that further appointments of the kind are in contemplation. The Notification of Births Act has been adopted in all but eight of the sanitary districts, and the houses in which births have taken place are visited by female sanitary inspectors or health visitors. In some districts the work of these officers is supplemented (as it is in Manchester) by that of a staff maintained by local health societies, who act in coöperation with the officers of the borough councils, and in this connexion "consultative centres" have been instituted in several parts of London. To these centres mothers bring

babies needing special attention, and advice is given as to their treatment, the progress of the child being watched and tested by weighing. At several of the local milk depôts the same course is pursued, and specially modified milk is supplied for children who cannot be fed from the breast. The medical officers of health of the districts in which these provisions exist speak favourably of their value, and Sir Shirley Murphy reports that the knowledge and experience gained by this means are all-important for the preservation of infant life.

*(To be continued.)*

# Looking Back.

FROM

## THE LANCET, *SATURDAY*, Jan. 14th, 1832.

### LONDON FEVER HOSPITAL.—IMPORTANT FACTS CONNECTED WITH FEVER CASES.

Subsequently to his reference to the above cases[1] Dr. Johnson made a few further remarks on the subject of the fever succeeding the cholera, when the following interesting and important facts were disclosed, which, to prevent misconception, we have verified by personal inquiry. Dr. Johnson stated that the fever after the blue stage, in the north of England, was of exactly the same character as the fever which was to be seen, at this moment, in the London Fever Hospital. In that institution, the medical officers had observed that the cases, since about June last, had assumed an entirely new character, fully justifying the supposition that a material change has lately been produced in the atmosphere of this country. During the last six months, fever, in that hospital, has exhibited a very severe typhoid form; and has been particularly fatal to elderly persons. This severity has been accompanied with great gastric irritation, so that almost every case presented an affection of the alimentary canal; so much so, that the physicians of the Fever Hospital have been prevented from prescribing purgatives, from the prevailing gastric irritation. General, and even local, blood-letting has been in comparatively few instances adopted, from the marked prostration which has characterised the prevailing epidemic.

We have not room to advert further at present to these facts, but we think it is the duty of the physicians of the hospital immediately to make public the experience which they have lately had in that institution.

## VITAL STATISTICS.

### HEALTH OF ENGLISH TOWNS.

In 76 of the largest English towns 8662 births and 4735 deaths were registered during the week ending Jan. 8th. The annual rate of mortality in these towns, which had been equal to 15·0, 15·4, and 16·7 in the three preceding weeks, declined to 14·8 in the week under notice. During the 13 weeks of last quarter the annual death-rate in these towns averaged 14·4 per 1000, against 15·6, the mean rate in these 76 towns during the corresponding quarter of the four preceding years 1905–08. The mean annual death-rate in London last quarter did not exceed 14·1 per 1000, and was 0·3 below the mean rate in the 76 towns. The lowest annual rates of mortality recorded in the 76 towns last week were 6·3 in East Ham, 6·5 in Handsworth, 7·4 in Hornsey, and 8·3 in Coventry; the rates in the other towns ranged upwards, however, to 22·9 in Huddersfield, 23·4 in Birkenhead, 23·5 in Warrington, and 25·4 in Hanley. In London the recorded death-rate last week was equal to 14·2 per 1000. The 4735 deaths registered in the 76 towns last week showed a decline of 541 from the number in the previous week, and included 242 which were referred to the principal epidemic diseases, against 273 and 291 in the two preceding weeks; of these 242 deaths, 77 resulted from whooping-cough, 44 from diphtheria, 36 from diarrhœa, 36 from measles, 33 from scarlet fever, and 16 from "fever" (principally enteric), but not one from small-pox. The annual rate of mortality from these epidemic diseases last week was equal to 0·8 per 1000, against 0·9 in each of the two preceding weeks. No death from any of these diseases was registered last week in Brighton, Tottenham, Norwich, Preston, Halifax, or in 11 other smaller towns; the annual death-rates therefrom ranged upwards, however, to 2·6 per 1000 in Birkenhead and in Swansea, 2·8 in Tynemouth, and 3·0 in Hanley. The fatal cases of whooping-cough, which had steadily increased in the six preceding weeks from 61 to 109, declined again last week to 77, but caused annual death-rates equal to 1·1 in Huddersfield, 1·3 in Newport (Mon.), and 1·7 in Plymouth. The 44 deaths from diphtheria were fewer by 7 than those in the previous week; they included 15 in London and its suburban districts, 3 in Manchester and Salford, and 2 each in Hanley, Nottingham, Derby, and Leeds. The 36 fatal cases of measles showed a decline of 14 from those in the previous week, but caused annual death-rates equal to 1·6 in Swansea and 1·7 in Birkenhead. The 36 deaths attributed to diarrhœa exceeded the number in the previous week by 2. The 33 fatal cases of scarlet fever were also within 2 of those returned in the previous week, and included 7 in Liverpool and Bootle, 3 in Birmingham and King's Norton, and 2 each in Bradford, Leeds, and Tynemouth. The deaths referred to "fever" in the 76 towns were 16, against 18 and 15 in the two preceding weeks, but included 2 in Swansea. The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had declined in the 12 preceding weeks from 2810 to 2362, had further fallen to 2256 on Saturday last; 212 new cases of this disease were admitted to these hospitals last week, against 224 and 244 in the two preceding weeks. The Metropolitan Asylums Hospitals contained 5 cases of small-pox on Saturday last. Of the 1331 deaths registered in London last week 338 were referred to pneumonia and other diseases of the respiratory system, against 332 and 360 in the two preceding weeks; these 338 deaths were no fewer than 151 below the corrected average number in the corresponding week of the five years 1904–08. The causes of 36, or 0·8 per cent., of the deaths registered last week in the 76 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in London, Leeds, Bristol, West Ham, Newcastle-on-Tyne, Hull, and in 47 other smaller towns; the 36 uncertified causes of death in the 76 towns last week included 5 in Birmingham, 5 in Liverpool, 3 in Sheffield, and 2 each in Manchester, Salford, and Gateshead.

### HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 986 births and 740 deaths were registered during the week ending Jan. 8th. The annual rate of mortality in these towns, which had steadily declined in the four preceding weeks from 23·8 to 18·9, rose again to 20·4 in the week under notice. During the 13 weeks of last quarter the annual death-rate in these Scotch towns averaged 17·7 per 1000, and exceeded by 3·3 the mean rate during the same period in the 76 largest English towns. The annual death-rates last week in these eight Scotch towns ranged from 13·8 in Leith and 16·3 in Aberdeen, to 26·6 in Perth and 26·7 in Dundee. The 740 deaths from all causes in the eight towns last week exceeded the number returned in the previous week by 65, and included 93 which were referred to the principal epidemic diseases, against 86 in each of the two preceding weeks. These 93 deaths were equal to an annual rate of 2·6 per 1000; the mean death-rate from the same diseases in the 76 English towns last week did not exceed 0·8 per 1000. The 93 deaths from these epidemic diseases in the Scotch towns last week included 55 from measles, 19 from diarrhœa, 6 from whooping-cough, 6 from scarlet fever, 5 from diphtheria, and 2 from "fever," but not one from small-pox. The fatal cases of measles, which had been 42 and 63 in the two preceding weeks, declined again to 55 last week, of which 52 occurred in Glasgow and 3 in Edinburgh. The 19 deaths attributed to diarrhœa exceeded the number in the previous week by 10, including 7 in Glasgow, 5 in Aberdeen, 3 in Dundee, and 2 in Edinburgh. Of the 6 deaths from whooping-cough, 3 occurred in Glasgow and 2 in Edinburgh; and 2 fatal cases

[1] The cases referred to were presented at a meeting of the London Medical Society on January 9th, 1832, by Dr. James Johnson, after remarks on The Cholera, its premonitory Symptoms, and Subsequent Fever, in England.

of scarlet fever were returned in Glasgow, in Edinburgh, and in Greenock. All the 5 deaths from diphtheria and the 2 deaths referred to "fever" were registered in Glasgow. The deaths in the eight towns last week referred to diseases of the respiratory system, which had been 215, 173, and 181 in the three preceding weeks, declined again last week to 172, but exceeded by 43 the number registered in the corresponding week of last year. The causes of 23, or 3·1 per cent., of the deaths in the eight towns last week were not certified or not stated; in the 76 English towns the proportion of uncertified causes of death last week did not exceed 0·8 per cent.

### HEALTH OF IRISH TOWNS.

In 22 town districts of Ireland, having an estimated population of 1,151,790 persons, 689 births and 435 deaths were registered during the week ending Jan. 8th. The mean annual rate of mortality in these towns, which had been equal to 18·2 and 25·4 per 1000 in the two preceding weeks, declined again to 19·7 in the week under notice. During the 13 weeks of last quarter the annual death-rate in these Irish towns averaged 19·1 per 1000, whereas the mean rate during the same period did not exceed 14·4 in the 76 largest English towns and 17·7 in the eight principal Scotch towns. The annual death-rate during last week was equal to 21·1 in Dublin, 19·7 in Belfast, 18·5 in Cork, 20·4 in Londonderry, 21·9 in Limerick, and 11·7 in Waterford; the mean annual rate last week in the 16 smallest of the Irish towns was equal to 17·9 per 1000. The 435 deaths from all causes in the 22 town districts during the week showed a decline of 122 from the high number returned in the preceding week, and included 36 which were referred to the principal epidemic diseases, against 18 and 32 in the two preceding weeks; these 36 deaths were equal to an annual rate of 1·6 per 1000; in the 76 English towns the mean rate from the same diseases last week did not exceed 0·8 per 1000, but in the eight principal Scotch towns it was equal to 2·6. The 36 deaths from these diseases in the Irish towns last week included 19 from whooping-cough, 7 from diarrhœa, 3 from diphtheria, 5 from "fever," and 2 from measles, but not one either from scarlet fever or small-pox. The 19 fatal cases of whooping-cough showed a further increase upon recent weekly numbers, and included 12 in Belfast, 3 in Dublin, and 2 in Limerick. Of the 7 deaths attributed to diarrhœa, 2 were returned both in Dublin and in Belfast. The 5 deaths referred to "fever" included 4 fatal cases of enteric, of which 2 occurred in Belfast and 1 each in Cork and in Portadown; the death from typhus was registered in Dublin. A fatal case of diphtheria was returned in Dublin, in Belfast, and in Cork; and both the deaths from measles occurred in Dublin. The deaths in the 22 town districts referred to pneumonia and other diseases of the respiratory system, which had been 83, 134, and 183 in the three preceding weeks, declined last week to 110. The causes of 9, or 2·1 per cent., of the deaths registered last week in the Irish towns were not certified; in the 76 English towns the proportion of uncertified causes of death last week did not exceed 0·8 per cent., while in the eight principal Scotch towns it was equal to 3·1 per cent.

### VITAL STATISTICS OF LONDON DURING DECEMBER, 1909.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to an annual rate of 5·4 per 1000 of the population, estimated at 4,833,938 persons in the middle of last year; in the three preceding months the rates were 7·1, 6·5, and 5·8 per 1000 respectively. The lowest rates were recorded in Hammersmith, Chelsea, St. Marylebone, Hampstead, Stoke Newington, Holborn, and Finsbury; and the highest rates in Fulham, Bermondsey, Lambeth, Deptford, Lewisham, and Woolwich. Four cases of small-pox, of which 3 belonged to Islington and 1 to Stepney, were notified during last month, and 4 small-pox patients remained under treatment in the Metropolitan Asylums Hospitals. The prevalence of scarlet fever showed a further decline last month; this disease was proportionally most prevalent in Fulham, Bermondsey, Lambeth, Greenwich, and Lewisham. The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals, which had been 2717, 2708, and 2460 at the end of the three preceding months, had further fallen to 2329 at the end of December; the weekly admissions averaged 250, against 394, 325, and 289 in the three preceding months. Diphtheria was rather less prevalent than in the preceding month; among the several metropolitan boroughs the greatest proportional prevalence of this disease was recorded in Paddington, the City of Westminster, Stepney, Deptford, Lewisham, and Woolwich. The Metropolitan Asylums Hospitals contained 904 diphtheria patients at the end of last month, against 901, 958, and 940 at the end of the three preceding months; the weekly admissions averaged 97, against 119 and 104 in the two preceding months. The prevalence of enteric fever also was slightly below that recorded in the preceding month; this disease was proportionally most prevalent last month in Kensington, Fulham, St. Pancras, Shoreditch, Stepney, Greenwich, and Woolwich. There were 62 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 75, 78, and 70 at the end of the three preceding months; the weekly admissions averaged 8, against 13, 11, and 10 in the three preceding months. Erysipelas was proportionally most prevalent in the City of London, Shoreditch, Bethnal Green, Stepney, Poplar, and Southwark. The 33 cases of puerperal fever notified during the month included 6 in Fulham, 4 in Camberwell, and 3 in Battersea. Of the 13 cases notified as cerebro-spinal meningitis, 2 belonged to Bermondsey, 2 to Lambeth, and 2 to Battersea.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ending Jan. 1st, 1910, the deaths of 6943 London residents were registered, equal to an annual rate of 15·0 per 1000; in the three preceding months the rates were 11·5, 11·3, and 13·8 per 1000. The death-rates last month ranged from 9·6 in Hampstead, 10·8 in Fulham, 11·5 in Lewisham, 11·9 in Woolwich, 12·1 in Stoke Newington, and 12·3 in Wandsworth, to 18·0 in St. Marylebone and in Southwark, 18·1 in Bermondsey, 19·0 in Finsbury, 19·4 in Shoreditch, and 25·2 in the City of London. The 6943 deaths from all causes included 326 which were referred to the principal infectious diseases; of these, 67 resulted from measles, 34 from scarlet fever, 42 from diphtheria, 122 from whooping-cough, 10 from enteric fever, and 51 from diarrhœa, but not any from small-pox, from typhus fever, or from ill-defined pyrexia. No death from any of these diseases was recorded last month in Stoke Newington; in the other boroughs they caused the lowest death-rates in Hammersmith, the City of Westminster, St. Pancras, and Camberwell; and the highest rates in Finsbury, the City of London, Shoreditch, Stepney, Poplar, Deptford, and Greenwich. The 67 fatal cases of measles showed a decline of 118 from the corrected average number in the corresponding period of the five preceding years; the greatest proportional mortality from this disease was recorded in Chelsea, Hackney, Finsbury, Bethnal Green, Stepney, Poplar, and Deptford. The 34 deaths from scarlet fever were 29 fewer than the corrected average number; this disease was proportionally most fatal in Paddington, Finsbury, Southwark, Bermondsey, Greenwich, Lewisham, and Woolwich. The 42 fatal cases of diphtheria showed a decline of 49 from the corrected average number in the corresponding period of the five preceding years; the greatest proportional mortality from this disease was recorded in Paddington, St. Marylebone, Finsbury, Shoreditch, Lambeth, and Woolwich. The 122 deaths from whooping-cough were 28 in excess of the corrected average number; the highest death-rates from this disease occurred in St. Marylebone, Shoreditch, Stepney, Poplar, Deptford, and Greenwich. The 10 fatal cases of "fever" showed a decline of 23 from the corrected average number; of these 10 deaths, 2 belonged to the City of Westminster and 2 to Stepney. The 51 deaths from diarrhœa were 31 fewer than the corrected average number; this disease was proportionally most fatal in Hampstead, Finsbury, Shoreditch, Stepney, Poplar, and Bermondsey.

## ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING DECEMBER, 1909.

*(Specially compiled for* THE LANCET.)

| CITIES AND BOROUGHS. | Estimated population in the middle of 1909. | NOTIFIED CASES OF INFECTIOUS DISEASE. | | | | | | | | | | | DEATHS FROM PRINCIPAL INFECTIOUS DISEASES. | | | | | | | | | | | Deaths from all causes. | Death-rate per 1000 living. | Deaths of infants under one year to 1000 births. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Small-pox. | Scarlet fever. | Diphtheria.* | Typhus fever. | Enteric fever. | Other continued fevers. | Puerperal fever. | Erysipelas. | Cerebro-spinal meningitis. | Total. | Annual rate per 1000 persons living. | Small-pox. | Measles. | Scarlet fever. | Diphtheria.* | Whooping-cough. | Typhus fever. | Enteric fever. | Other continued fevers. | Diarrhœa. | Total. | Annual rate per 1000 persons living. | | | |
| LONDON... ... ... ... ... ... ... ... | **4,833,938** | **4** | **1363** | **557** | **—** | **86** | **3** | **33** | **450** | **13** | **2509** | **5·4** | **—** | **67** | **34** | **42** | **122** | **—** | **10** | **—** | **51** | **326** | **0·7** | **6943** | **15·0** | **112** |
| *West Districts.* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Paddington ... ... ... ... ... ... ... | 151,955 | — | 35 | 24 | — | 1 | — | — | 13 | — | 73 | 5·0 | — | 2 | 2 | 3 | 2 | — | — | — | 1 | 10 | 0·7 | 226 | 15·5 | 115 |
| Kensington ... ... ... ... ... ... ... | 183,683 | — | 47 | 11 | — | 4 | — | 1 | 18 | 1 | 82 | 4·7 | — | 4 | — | 1 | 2 | — | — | — | — | 7 | 0·4 | 250 | 14·2 | 173 |
| Hammersmith ... ... ... ... ... ... | 125,704 | — | 32 | 8 | — | 1 | — | — | 10 | — | 51 | 4·2 | — | — | 1 | — | — | — | 1 | — | — | 2 | 0·2 | 157 | 13·0 | 116 |
| Fulham ... ... ... ... ... ... ... ... | 176,406 | — | 70 | 22 | — | 6 | — | 6 | 11 | 1 | 116 | 6·9 | — | 1 | 2 | 2 | 3 | — | — | — | 2 | 10 | 0·6 | 182 | 10·8 | 89 |
| Chelsea ... ... ... ... ... ... ... ... | 75,249 | — | 16 | 6 | — | — | 1 | — | 1 | — | 24 | 3·3 | — | 3 | — | 1 | 1 | — | — | — | 1 | 6 | 0·8 | 119 | 16·5 | 136 |
| City of Westminster ... ... ... ... ... | 168,883 | — | 46 | 34 | — | 3 | — | 1 | 12 | — | 96 | 5·9 | — | — | 1 | 1 | — | — | 2 | — | — | 4 | 0·2 | 225 | 13·9 | 89 |
| *North Districts.* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| St. Marylebone ... ... ... ... ... ... | 126,027 | — | 24 | 8 | — | — | — | — | 12 | 1 | 45 | 3·7 | — | — | — | 2 | 6 | — | — | — | 1 | 9 | 0·7 | 217 | 18·0 | 64 |
| Hampstead ... ... ... ... ... ... ... | 94,185 | — | 15 | 6 | — | 2 | — | — | 1 | 1 | 25 | 2·8 | — | — | — | 1 | — | — | 1 | — | 2 | 4 | 0·4 | 87 | 9·6 | 105 |
| St. Pancras ... ... ... ... ... ... ... | 237,422 | — | 73 | 25 | — | 11 | — | — | 18 | — | 127 | 5·6 | — | — | — | — | 5 | — | — | — | 2 | 7 | 0·3 | 364 | 16·0 | 131 |
| Islington ... ... ... ... ... ... ... ... | 351,202 | 3 | 87 | 38 | — | 5 | — | 2 | 16 | 1 | 152 | 4·5 | — | 1 | 4 | 3 | 10 | — | — | — | 3 | 21 | 0·6 | 512 | 15·2 | 132 |
| Stoke Newington ... ... ... ... ... | 54,423 | — | 7 | — | — | 1 | — | — | 4 | — | 12 | 2·3 | — | — | — | — | — | — | — | — | — | — | — | 63 | 12·1 | 69 |
| Hackney ... ... ... ... ... ... ... ... | 237,601 | — | 64 | 23 | — | 4 | — | 2 | 28 | — | 121 | 5·3 | — | 8 | 1 | 3 | 4 | — | — | — | 2 | 18 | 0·8 | 341 | 15·0 | 103 |
| *Central Districts.* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Holborn ... ... ... ... ... ... ... ... | 53,802 | — | 8 | — | — | 1 | — | — | 2 | — | 11 | 2·1 | — | — | — | — | 1 | — | — | — | 1 | 2 | 0·4 | 80 | 15·5 | 51 |
| Finsbury ... ... ... ... ... ... ... ... | 95,289 | — | 14 | 10 | — | 2 | — | 1 | 10 | — | 37 | 4·0 | — | 3 | 2 | 2 | 2 | — | 1 | — | 3 | 13 | 1·4 | 174 | 19·0 | 88 |
| City of London ... ... ... ... ... ... | 18,193 | — | 2 | 2 | — | 1 | — | — | 4 | — | 9 | 5·2 | — | — | — | — | 1 | — | 1 | — | — | 2 | 1·1 | 44 | 25·2 | 190 |
| *East Districts.* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shoreditch ... ... ... ... ... ... ... | 114,802 | — | 18 | 13 | — | 3 | — | 1 | 24 | — | 59 | 5·4 | — | — | — | 3 | 8 | — | — | — | 3 | 14 | 1·3 | 214 | 19·4 | 149 |
| Bethnal Green ... ... ... ... ... ... | 131,316 | — | 32 | 16 | — | 1 | — | 2 | 25 | — | 76 | 6·0 | — | 4 | — | 1 | 3 | — | — | — | 1 | 9 | 0·7 | 226 | 17·9 | 124 |
| Stepney ... ... ... ... ... ... ... ... | 312,525 | — | 54 | 47 | — | 7 | — | 2 | 49 | 1 | 160 | 5·3 | — | 18 | 2 | 1 | 16 | — | 2 | — | 9 | 48 | 1·6 | 507 | 16·9 | 130 |
| Poplar ... ... ... ... ... ... ... ... | 171,965 | — | 37 | 16 | — | 3 | — | — | 23 | — | 79 | 4·8 | — | 10 | 1 | 1 | 15 | — | 1 | — | 3 | 31 | 1·9 | 285 | 17·3 | 126 |
| *South Districts.* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Southwark ... ... ... ... ... ... ... | 211,125 | 1 | 45 | 22 | — | 1 | — | 1 | 30 | — | 100 | 4·9 | — | 1 | 3 | 1 | 7 | — | — | — | 3 | 15 | 0·7 | 365 | 18·0 | 121 |
| Bermondsey ... ... ... ... ... ... ... | 127,569 | — | 53 | 17 | — | 2 | — | — | 11 | 2 | 85 | 6·9 | — | 1 | 2 | — | 3 | — | — | — | 6 | 12 | 1·0 | 221 | 18·1 | 122 |
| Lambeth ... ... ... ... ... ... ... ... | 324,188 | — | 144 | 38 | — | 4 | — | 2 | 21 | 2 | 211 | 6·8 | — | — | 1 | 5 | 5 | — | 1 | — | — | 12 | 0·4 | 473 | 15·2 | 108 |
| Battersea ... ... ... ... ... ... ... | 186,036 | — | 65 | 23 | — | 4 | — | 3 | 9 | 2 | 106 | 5·9 | — | 2 | — | 1 | 3 | — | — | — | 2 | 8 | 0·4 | 237 | 13·3 | 132 |
| Wandsworth ... ... ... ... ... ... ... | 297,646 | — | 81 | 38 | — | 1 | — | 1 | 21 | — | 142 | 5·0 | — | 2 | 1 | 3 | 3 | — | — | — | 1 | 10 | 0·4 | 351 | 12·3 | 74 |
| Camberwell ... ... ... ... ... ... ... | 283,022 | — | 93 | 27 | — | 3 | — | 4 | 24 | — | 151 | 5·6 | — | — | 1 | 2 | — | — | — | — | 3 | 6 | 0·2 | 346 | 12·7 | 95 |
| Deptford ... ... ... ... ... ... ... ... | 118,583 | — | 27 | 19 | — | 2 | 2 | 1 | 18 | 1 | 70 | 6·2 | — | 5 | 1 | 1 | 9 | — | — | — | 1 | 17 | 1·5 | 185 | 16·3 | 138 |
| Greenwich ... ... ... ... ... ... ... | 111,014 | — | 36 | 10 | — | 7 | — | 2 | 9 | — | 64 | 6·0 | — | 2 | 2 | 1 | 9 | — | — | — | 1 | 15 | 1·4 | 163 | 15·3 | 127 |
| Lewisham ... ... ... ... ... ... ... | 160,749 | — | 94 | 31 | — | 3 | — | — | 16 | — | 144 | 9·3 | — | — | 4 | 1 | 1 | — | — | — | — | 6 | 0·4 | 177 | 11·5 | 70 |
| Woolwich... ... ... ... ... ... ... | 133,374 | — | 44 | 23 | — | 3 | — | 1 | 7 | — | 78 | 6·1 | — | — | 3 | 2 | 3 | — | — | — | — | 8 | 0·6 | 152 | 11·9 | 86 |
| Port of London ... ... ... ... ... | — | — | — | — | — | — | — | — | 3 | — | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

* Including membranous croup.

In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was 40·3 per cent. below the average.

Infant mortality, measured by the proportion of deaths under one year of age to registered births, was equal to 112 per 1000 last month. The lowest rates of infant mortality were recorded in St. Marylebone, Stoke Newington, Holborn, Finsbury, Wandsworth, Lewisham, and Woolwich; and the highest rates in Kensington, the City of London, Shoreditch, Chelsea, St. Pancras, Islington, Battersea, and Deptford.

## THE SERVICES.

### ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Surgeons: T. F. O'Keeffe to the *Victory*, additional, for disposal; E. M. W. Hearn to the *Victory*, additional.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel R. Porter, Administrative Medical Officer at Belfast, is appointed Principal Medical Officer in the Western Command, *vice* Colonel G. T. Goggin. Lieutenant-Colonel E. H. Lynden-Bell is appointed to command the Station Hospital, Meerut, and Major H. T. Pocock to command the Station Hospital, Shahjehanpur. Major Swabey is appointed specialist in midwifery and diseases of women and children in the 5th (Mhow) Division. Lieutenant-Colonel H. Greany has been appointed Senior Medical Officer, Ceylon, vice Lieutenant-Colonel N. Manders. Captain J. W. S. Seccombe, who is serving in India, is appointed specialist in the prevention of disease, from Oct. 25th, 1909. Lieutenant-Colonel J. J. Gerrard is appointed Medical Inspector of Recruits for the Northern Command, England, Major J. H. E. Austin Recruiting Medical Officer to the London District, Major J. C. Morgan Sanitary Officer to the Irish Command, and Major S. G. Moores Staff Officer to the Principal Medical Officer, Aldershot Command. Major S. L. Cummings is attached to the Pathological Department at the Royal Army Medical College. Major C. W. Duggan, R.P., is appointed to the medical charge at Lincoln. Major H. G. Cummins, R.P., is appointed Professor of Botany and Agriculture to the University College, Cork.

### INDIAN MEDICAL SERVICE.

Lieutenant-Colonel J. Sykes, Bengal, is permitted to retire from the service from Dec. 14th, 1909. Lieutenant-Colonel Weir, Lieutenant-Colonel Collie, and Lieutenant-Colonel Barry retire from Feb. 21st, 1910, and Nov. 18th, 1909, respectively. Lieutenant-Colonel Evans proceeds on a year's furlough, prior to retirement. Captain Good takes over charge of Moulmein Hospital, Burma. Major Leverton is transferred from Lakhimpur to Jalpaiguri as civil surgeon, where he will relieve Major Green, transferred as civil surgeon, Mymensingh. Captain Moses, Medical College Hospital, is appointed to act as civil surgeon, Purneah, and Captain Dutton to officiate as resident physician, Medical College Hospital, vice Captain Coppinger on leave. Captain G. E. Stewart is detailed to proceed to Somaliland on field service with the 127th Baluch Light Infantry, of which regiment he is the medical officer. Captain Williams is placed on special duty under the Bombay Government. Captain Young goes to the United Provinces for employment in the sanitary department, and Captain Overbeck Wright reverts to military duty. Lieutenant Densham resigns the service. Lieutenant V. B. Green-Armytage, medical officer attached to the 9th Bhopal Infantry at Rangoon, is appointed a specialist in midwifery and diseases of women and children, Burma Division. Captain A. D. White is appointed specialist in advanced operative surgery, 8th (Lucknow) Division, from Sept. 17th, 1909. Lieutenant H. H. Thorburn is promoted to be Captain, from Sept. 1st, 1909. His commission as Lieutenant dates from Sept. 1st, 1906.

There will be an exceptional flow of promotion shortly in the Indian Medical Service. Sir Gerald Bomford retired on Dec. 31st, 1909, and Colonel Lukis will presumably be confirmed as Director-General. The following Inspectors-General of Civil Hospitals will complete their five years' term in 1910:—Colonel Macrae, Bengal, Feb. 28th; Colonel R. D. Murray (on leave), United Provinces, March 28th; Colonel King, Burma, May 24th; Colonel Bate, Punjab, July 11th; Colonel Weir, Central Provinces, Oct. 25th. Colonel C. H. Beatson, Principal Medical Officer, Peshawar Division, will also be due to retire on June 15th.

### TERRITORIAL FORCE.

*Infantry.*

6th (Renfrewshire) Battalion, Princess Louise's (Argyll and Sutherland Highlanders): Surgeon-Captain Wallace A. Pride resigns his commission (dated Dec. 6th, 1909).

*Royal Army Medical Corps.*

3rd West Lancashire Field Ambulance: Captain Claude W. S. Saberton resigns his commission (dated Nov. 27th, 1909).

1st South Midland Field Ambulance: Lieutenant Seymour G. Barling to be Captain (dated Dec. 8th, 1909).

3rd Welsh Field Ambulance: Captain David L. Davies resigns his commission (dated Dec. 1st, 1909).

2nd Southern General Hospital: Major Arthur L. Flemming resigns his commission (dated Nov. 27th, 1909).

*Attached to Units other than Medical Units.*—Lieutenant Walter Fitzpatrick to be Captain (dated Oct. 28th, 1909). Captain William T. Hannah to be Major (dated Dec. 2nd, 1909).

### VOLUNTEER OFFICERS' DECORATION.

The King has conferred the Volunteer Officers' Decoration upon the undermentioned officers who have been duly recommended for the same under the terms of the Royal Warrant dated July 25th, 1892:—

*Territorial Force:* Wessex Divisional Engineers, Royal Engineers: Surgeon-Major Joseph Fuller (retired). 4th Battalion, The Prince of Wales's Volunteers (South Lancashire Regiment): Surgeon-Major Joseph Adams. 6th Battalion, The Manchester Regiment: Surgeon-Major George Henry Darwin (retired). 3rd Wessex Field Ambulance, Royal Army Medical Corps: Lieutenant-Colonel Harry Munyard Brownfield (retired).

*Volunteers:* 1st Devonshire Royal Garrison Artillery (Volunteers): Surgeon-Lieutenant Arthur Goulston (retired). 4th Volunteer Battalion, The Norfolk Regiment: Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel (Brigade Surgeon-Lieutenant-Colonel, Senior Medical Officer, Norfolk Volunteer Infantry Brigade) Charles Arthur Owen Owens (retired). 2nd (Berwickshire) Volunteer Battalion, The King's Own Scottish Borderers: Surgeon-Major Samuel Macvie (retired). 2nd Volunteer Battalion, The Highland Light Infantry: Surgeon-Major Walter Sandeman (retired).

### THE INDIAN SUBORDINATE MEDICAL DEPARTMENT.

The *Pioneer Mail*, in a telegram dated Calcutta, Dec. 20th, states that "The effective strength of assistant surgeons of the Indian Subordinate Medical Department has been fixed at 472, of which the following are details: Military appointments, 353; reserve at 20 per cent., 71. Miscellaneous appointments, 42. Railway appointments, 28. Civil appointments, 131; reserve, at 15 per cent., 30; total, 655.

### DEATHS IN THE SERVICES.

Surgeon-Major-General Charles Dodgson Madden, C.B., A.M.D., recently at St. Leonards-on-Sea, aged 77 years. He joined the service as assistant surgeon in 1854, became surgeon in 1867, surgeon-major in 1868, deputy-surgeon-general in 1876, surgeon-major-general in 1882, and retired in 1893. He served during the Crimean war (medal with clasp and Turkish medal), and was also with the 43rd Light Infantry in the Sangor Field Division in 1857, and in the Field Division under Colonel Primrose in 1859 (medal). Throughout the Abyssinian Campaign he served as surgeon of the 4th King's Own, and was present as field surgeon of the 1st Brigade at the action of Arogee and the capture of Magdala (mentioned in despatches and promoted surgeon-major "for valuable services rendered during the campaign," medal).

### THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

Among the technical articles in the January issue of the *Journal of the Royal Army Medical Corps* the first place is given to an original communication by Captain Douglas B. Thompson, R.A.M.C., and Dr. Andrew Balfour, director of the Wellcome Research Laboratories, on "Two Cases of Non-ulcerating 'Oriental Sore,' better termed Leishman Nodules." It is a careful study of the subject, illustrated by ten process reproductions of photographs of the patient and of the microscopic appearances of the growths. The authors promise a further

paper on the subject at a later date. A most interesting contribution is that from the pen of Major H. A. L. Howell, R.A.M.C., who tells the story of the army surgeon and the care of the sick and wounded in the British army from 1660 to 1688. The British standing army in 1661 consisted of 5000, who were paid by the Crown. The surgeon and his mate in a foot regiment together received 6*s.* 6*d.* per day, and there is a record of a chirurgeon drawing 4*s.* per day and his mate 2*s.* 6*d.* In the same year a pay list of the regiment of Horse Guards shows "chirurgeon ivs, and j horse to carry his chest, ijs.....vis *per diem.*" In the Life Guards the pay was 6*s.* per day and 2*s.* for a horse. It would appear that at one time charges for drugs were made against the Crown, but later an allowance was made for "physic for internal medicines." Lieutenant-Colonel R. J. S. Simpson, C.M.G., continues his articles on the Medical History of the South African War. Major J. P. Anderson, R.A.M.C., writes on Malaria in India. Captain R. H. Bridges, R.A.M.C., has a useful and suggestive article on the care of the soldier's foot mainly from the point of view of a well-fitting boot.

THE NAVAL MEDICAL SUPPLEMENTAL FUND.

At the quarterly meeting of the directors of the Naval Medical Supplemental Fund, held on Jan. 11th, Sir J. N. Dick, K.C.B., in the chair, the sum of £72 10*s.* was distributed among the several applicants.

# Correspondence.

"Audi alteram partem."

## ASEPSIS AND ANTISEPSIS.

*To the Editor of* THE LANCET.

SIR,—It seems to me that there are only three answers to the facts which I brought forward in my paper of Jan. 1st: (1) to admit their importance and look into the methods by which they were obtained; (2) to show that results as good, if not better, can be obtained by other methods; and (3) to throw doubt on the accuracy of the observations and the judicial care which had been exercised in classifying them. I am sorry to see that the replies, so far, have leaned towards the third heading, for it is the feeblest possible answer and one which stops further discussion. It, of course, admits at once my contention, that these results are better than those obtained by the methods so much in vogue.

I must confess that I was disappointed with the way in which my statistics turned out. Judging from my results in private, where the treatment of the cases is in my own hands, I expected that the percentage of infection would have been well under 1, instead of nearly 2. I, therefore, quite thought that if anyone of Mr. Sargent's experience in the modern methods took up the discussion it would have been on the second lines, and then it would have been a very interesting point to ascertain how far the methods which he used and those which I advocated approximated each other.

I need only say in reply to what has been said that I stated in my paper that I had verified the statements made, which surely means that I had looked into them carefully, and published them on my own personal responsibility. As I have said above, my results where I treat the cases from beginning to end are better than those shown in the statistics, and this statement will set Mr. Sargent's mind at rest as regards their value. As to the criterion adopted—that was the presence of pus as evidence of infection. Whether there is only one drop or a pint is a matter of no consequence from this point of view, the presence of any pus at all shows infection. I am afraid that what I write is not always read so much as I should like, otherwise it would be well known that I do not deluge my wounds with antiseptics; on the contrary, I strongly deprecate that practice and have repeatedly pointed out how contrary it is to Lister's teaching. To let bacteria into a wound and then try to get rid of them by douching with antiseptics is a very unsatisfactory procedure, and may be harmful, for once bacteria have entered a wound their eradication must be effected by the tissues, and these must, therefore, not be injured by manipulations, antiseptics, &c. Bacteria must be dealt with before they enter the wound, not after. The principles I follow are: (1) to start the operation clean (bacteriologically); (2) to keep clean during the operation; and (3) to see that the wound remains clean afterwards. All this can be done without any application of antiseptics to the wound, but I doubt if it can be done with certainty, especially in prolonged operations, without the assistance of antiseptics used outside the wound, especially to prevent reinfection of hands, instruments, &c. If Mr. Sargent would do me the honour of reading some of my writings—e.g., the Bradshaw Lecture, published last year—he would acquire some knowledge of the methods which I use, and perhaps he would not find them so "obsolescent" after all, and might realise that he could improve his results by the adoption of some of them.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 10th, 1910. W. WATSON CHEYNE.

*** Sir W. Watson Cheyne's Bradshaw Lecture on the Treatment of Wounds was published in THE LANCET, vol. ii., 1908, p. 1797.—ED. L.

*To the Editor of* THE LANCET.

SIR,—This very interesting correspondence has opened up the question of what ought to come in contact with a wound treated antiseptically. Mr. Sargent says, "The antiseptic school maintains that the chemicals should be poured upon a clean wound." Personally, I think he is mistaken when he states that this is the opinion of that school, because any chemicals poured on to a clean wound would have to be practically of caustic strength to kill living organisms. I have seen Lister operate many times, and while he washed wounds with carbolic solution, it was for the purpose of cleansing them from blood-clot and not with the intention of killing living organisms, as he knew well that this could not be done in the time with the strength of the solution he used. It is an entirely different matter when pure carbolic acid is poured on to a clean wound, as was the practice of one hospital surgeon, and which plan was carried out by one of his pupils a few weeks ago.

I do not consider that there is much to choose between the aseptic and the antiseptic methods, provided that either is carried out thoroughly, sensibly, and not simply as a matter of routine, but there are many loopholes for mistakes, without going the length I once saw, of a wire, after being straightened under a spectator's boot, passing at once into the abdomen, but the carbolic spray at that time was supposed to cover a multitude of sins!

I am, Sir, yours faithfully,

Jan. 10th, 1910. SKENE KEITH.

## EXTRACT OF PARATHYROID GLAND.

*To the Editor of* THE LANCET.

SIR,—In your interesting leading article on the parathyroids last week you urge the importance of a further study of the therapeutic effects of parathyroid extract. Such investigation is undoubtedly desirable, but my experience is that the practical difficulties in obtaining enough extract are very great. It is now well known that the parathyroids cannot be distinguished from accessory thyroids, lymphatic glands, or isolated nodules of thymic tissue except with the help of the microscope, and that any of these latter tissues may be enclosed in the same capsule as a parathyroid. Before we can justly draw conclusions as to the effects of parathyroid treatment we must be quite sure that our extract is made from parathyroid tissue and nothing else. But this means a microscopical examination of every minute gland used in making the extract and the effect of this precaution on the cost of manufacture is obvious.

I tried to obtain a trustworthy extract for the purpose you mention from various English firms, but without success. Then, as I often read of its use in the American medical journals, I hoped to secure a supply from an American source. A leading firm could have supplied me with what I may call "reputed" parathyroid extract, but could not quote the pure extract—which, of course, is alone of value for investigations—at a lower price than £100 per pound! Perhaps heavy drug bills are less unpopular on the other side of the Atlantic than on this, unless, indeed, the treatment in America is carried out with the reputed extract. If

this includes thyroid extract, and, as is quite possible, contains little or no parathyroid tissue, its therapeutic use is likely to cause ambiguous results.

I am, Sir, yours faithfully,

Queen Anne-street, W., Jan. 10th, 1910. DAVID FORSYTH.

## STATE REGISTRATION OF NURSES.

*To the Editor of* THE LANCET.

SIR,—The report of the speech of the Hon. Sydney Holland at a recent meeting of the Cottage Benefit Nursing Association makes curious reading. No one suggests, as he apparently assumes, that because a nurse has passed a State examination therefore she has *all* the attributes of the *best* nurse, any more than that everyone called to the Bar has the erudition of a Williams or the insight into human nature of a Russell, but merely the fact that a woman has satisfied a competent board of examiners that she has undergone, say, three years' training in a well-equipped hospital, and that she understands the principles and practice of her profession would be some guarantee that she was capable of undertaking the duties of a nurse. "He admitted the evils arising out of the present state of affairs," but went on to suggest that, to assess the amount of knowledge of nursing of the lady in the uniform would be likely to bring about a worse state of things than obtains at present. "There were things far more important in a nurse than mere ability to answer the questions of an examiner." True, but the same might be said about the medical profession or, in fact, any profession which entails the passing of an examination before the examinee is allowed to follow his calling. But because this is so does Mr. Holland suggest that there should be no general recognised average test of the claimant to the particular calling? To say that the holder of a pass certificate may not know all or be all that a nurse should be is to state a truism, but to suggest that because she has satisfied a competent assessor that she does know something therefore she is less of a nurse or further from the ideal is ridiculous.

No one with any acquaintance with the world of quackery which surrounds the practice of medicine will for one moment suggest that if State registration of nurses were an accomplished fact none but well-qualified nurses would go clothed in any of the mystic mantles or adorned with the *chic* headgear which we are accustomed to associate with the doctor's true help-maiden. That were too much to expect, but because there would still be usurpers of the toga is no reason why the Legislature should not say "you shall not behave in such a manner as will lead the general public to believe you are a properly trained registered nurse, and if you do you shall be liable to prosecution." But for the eminence of the speaker and the work he has done for hospitals, his illogical and reactionary dicta might easily have been passed over.

It would seem from the tone of the speeches generally at the meeting that the participators in the debate were unaware that State registration has been tried in some countries, and has not been found to produce the evil effects which the speakers foreshadowed. There was placed on the Statute Book of New Zealand, mainly through the efforts of Mrs. Neil, late assistant inspector of hospitals, a Nurses' Registration Act. By this Act a candidate for registration must show a three years' consecutive training at certain recognised hospitals and pass the State examination. One result of this has been to lessen the difficulty of the patient or doctor seeking a qualified nurse. No longer need he wade through the lengthy tribute to the claimant's skill and knowledge, his difficulty in deciphering the signatures of the attesting witnesses is removed, and he has come to be able to look upon the elaborate *sigilla* with a respectful but proper regard. "Are you on the Register?" is all that he need ask to come to a decision with regard to her employment. He has still a power of election just as a person suffering from a disease has with respect to his medical attendant, and if B comes nearer his ideal of what a nurse should be he need not engage A solely because she is a duly registered nurse.

In England it is not unknown for a matron of one hospital to suggest that a woman cannot be properly trained in any institution except the one under her control. The suggestion may be true but it is unlikely; in any case as all nurses cannot pass through that particular hospital there is found to be some degree of dissent amongst the various teachers and amongst those taught. It would be an easy matter for the examining board to decide what certificates should be accepted, and if the candidate trained at any of the authorised hospitals satisfied the examiners as to her knowledge of the art of nursing she should be allowed to label herself as a duly qualified nurse. No Act can be retro-active, and it may be that at first some unqualified persons will in virtue of their having been in practice for a certain period before the coming into force of the Act be enrolled upon the Register. This is unavoidable and has happened with respect to all so-called protected professions, but a limitation can easily be inserted into the Act preventing such untrained persons both from coming up for examination or getting on the Register. The sooner, however, this time period is set up the sooner will the registered nurse come to mean a properly qualified person.

A Bill on the lines of the New Zealand Act would, I am certain, work for the benefit of an often ill-paid and poached-upon profession. It would be something also if a section could be introduced which would make for some uniformity in the habiliments of nurses in public. If a distinctive dress for outside parade purposes is necessary, then I trust the board would be satisfied with something less stage-like than some of the dresses seen in London streets. Every colour would seem to have been impressed into the service and some of the combinations are not what would be termed "chords." To anyone interested in the exact wording of the New Zealand Act the High Commissioner would, I am certain, gladly put at their disposal a copy of the statute.

I am, Sir, yours faithfully,

J. M. MASON,
Medical Officer of Health, New Zealand.

Highgate, Jan. 4th, 1910.

## CIVILISATION AND THE CORSET.

*To the Editor of* THE LANCET.

SIR,—In the discussion that has appeared in your columns under this heading much critical disagreement might perhaps have been saved if the term "corset" had been more clearly defined. The word itself seems to convey to many people merely the idea of an article of apparel intended to æsthetically improve the shape of the feminine figure in accordance with the dictates of fashion, whether this be by constricting the waist, flattening the abdomen, or perverting the natural position of the breasts. That corsets may have been used for this alien purpose by a foolish minority is, of course, obvious, otherwise medical strictures would never have arisen; but it is equally obvious, by the light of their history and evolution, that corsets were never intended for this purpose, nor are they indeed so used by the masses of women who universally adopt them. The true intention of the corset is more rightly conveyed by its old English synonym "stays," because "to stay" means to hold an object in its precise and proper place without any overpull in one direction or another, just as indeed the mast of a ship is held by its stays in a true position. Of course, if any part of the human body has to be "stayed" this presumes some structural disability, but it will be found that this structural disability does exist and that, with the majority of women in all ages, it has been met by some form of loin band, this band in the present day being embodied in the garment known as the corset.

In my previous letter I pointed out that the ancients wore their "corsets" in three separate pieces—the loin-band, the waist-band, and the breast-band. I insisted, as indeed was the case, that the loin band was the universally used and essential piece and that the other two were occasional and adjunctive only. Similarly in the modern corset, which has been evolved from the triple bands of the ancients, it is that part which represents the loin band that is alone essential and the other parts of the corset are generally adjunctive, although in special instances they might be of service in the support of pendulous breasts or of weakly backs. For the sake of clearness I may at once define the area that is covered and "stayed" by the loin band. This band takes its grip behind on the sacrum and on the lower lumbar vertebræ, and it supports the abdomen in front from a little above the umbilicus down to the pubic bone. This particular abdominal area has with most women to be "stayed," and there has been an instinctive impulse on the part of all

women from the earliest records onwards to so gird their loins that the abdomen is supported over the area I have mentioned, whether this has been done by a leather or network zone, by any simple textile bandage, or by the article of apparel now known as the corset. And I maintain that this instinctive impulse to obtain support has its origin in a more or less general structural disability of the body when in an erect position.

With this preamble I may now proceed to a review of the whole discussion. It was initiated in a masterly article by Mr. W. Arbuthnot Lane, who, as the results of his large intra-abdominal experience, gave a series of important and sequential facts. He pointed out that in consequence of man's persistently erect position his abdominal viscera tended to downward displacement. He showed that nature endeavoured to meet this disability by strengthening the inadequate visceral slings by means of extra or "acquired" peritoneal bands. He demonstrated that this effort of nature to prevent lapse most frequently proved insufficient and that the abdominal organs gravitated downwards. He then described the condition, that of intestinal stasis and autointoxication, which inevitably ensued. And he finally asserted that by far the most important factor in the treatment of this morbid condition was a particular kind of corset that lifted the abdomen below the umbilicus in a direction upwards and backwards, but left the rest of the abdomen free from pressure. It will be observed that the area of support indicated by Mr. Arbuthnot Lane is, as is only natural, precisely the one embodied in the loin-band hold to which I have previously referred.

In my letter which followed Mr. Arbuthnot Lane's article I was able to add some further corroborative facts. With a somewhat lengthy extra-abdominal experience acquired whilst dealing with such things as hernia and moveable kidney, I had long since found that the lower abdominal walls were very frequently stressed by the descent of the organs in consequence of the yielding of their sustaining peritoneal slings. In writing on corsets some few years since I pointed this out, and, taking a mechanical or morphological view of the body, I explained it by the fact that man is built for a quadruped and not for an erect position, and that therefore neither his peritoneal slings nor his abdominal walls are adequate to resist the persistent drag of gravity upon his abdominal viscera. I also opined that in all likelihood the abdominal walls were by evolution strengthening, and it would appear from Mr. Arbuthnot Lane's observations than the peritoneal slings are tending also to strengthen in a similar way. And I advocated the use of corsets with the proper loin-band hold, because it appeared to me that they were in most instances positively necessary to combat the inherent structural disability under which mankind suffers when in the erect posture.

The physiology of intestinal congestion or stasis was carefully worked out by Professor Roy, M.D., F.R.S., and Professor Adami, M.A., when they issued their conjoint paper on Waist-belts and Stays in 1888. I referred to their paper in my last letter, and I may make some additions. They took the beneficial use of a waist-belt, whether solely or embodied in a stay or corset, as an accepted fact, and they were seeking simply to find an explanation. Their experiments were made with particular reference to the circulation, and they came, although in a different way, to precisely the same conclusions as those of Mr. Arbuthnot Lane—namely, that in consequence of the erect position of the body a large amount of waste blood accumulated in the intestines even with the strong, whilst with the weakly this amount was greatly increased. They held that the remedy for this condition was gentle compression of the lower abdominal walls. Hence they asserted that "the waist-belt is of use and has been constantly used in those cases where, through want of tone in the abdominal wall, it becomes necessary to counteract the tendency to a useless storing up of blood in the abdomen, and also most frequently by those in perfect health to bring more blood into the service of the brain and muscles so as to conduce to an increase of mental and muscular activity." And, in perfect fairness of mind, they concluded their paper with the following words: "The authors are emphatically not advocates of tight-lacing. Their desire has been to point out that the widely spread habit of wearing some form or other of waistband, which may almost be termed an instinct, has a physiological basis and is not of purely æsthetic origin." One word of explanation I may add, and it is that their term "waist-belt" is intended to denote what I have called loin band, and that it did not extend as high as the waist at all, and therefore did not compress it.

Now I think all that I have previously given is a statement of the actually observed facts that have a bearing on the use of corsets. It will be interesting now to note the views of your correspondents. One of them, Dr. Lætitia H. Andrew-Bird is entirely in favour of the use of proper corsets, and being a lady doctor of long experience her confirmatory opinion must necessarily have considerable weight. Another, Mr. H. M. M. Woodward, corroborates Mr. Arbuthnot Lane's observations as to chronic intestinal stasis. But the rest advance various arguments in opposition to the use of corsets, and these arguments I will proceed to examine.

Dr. Cecil E. Fish, in a carefully considered letter, first states that there are many women who never require corsets. This statement may be readily admitted. If their abdominal walls are tonic and their mesenteric slings do not yield then they may be able for the time or even for life to do without stay support. But the fact that some few women can dispense with corsets cannot be held conclusive as against their use by the majority. This argument has been used before and is generally put by its advocate thus: "I have known many women who have been able to go through life without corsets and therefore corsets are bad in themselves and should be dispensed with." But that this reasoning is illogical can be shown by analogy. For instance, the same advocate might urge: "I have known many women who have been able to go though life without marriage and therefore marriage is bad in itself and should be dispensed with." It is clear that it is the experiences of the majority that have to be considered and not those of the perhaps luckier minority.

Then again, Dr. Cecil Fish raises the respiratory argument. Now this is based entirely on the assertion of Hutchinson that the pectoral breathing of women was due to the wearing of corsets. I am strongly of the opinion that Hutchinson, after his erudite investigations into respiration, found himself faced with the necessity of giving some reason for this pectoral breathing, and that he seized on the corset theory as the only one open to him. In any event it is wrong to assume that Hutchinson's view was accepted by physiologists. On the contrary, Mr. John Marshall, in his classical work on Physiology, wrote: "Pectoral breathing is the characteristic form of breathing in the female, a fact which has by some been attributed to the habitual use of stays, but which may be a provision against the impediment to abdominal respiration which occurs in that sex."

However, as Dr. Cecil Fish's argument was worthy of more than verbal dispute, I determined to submit the point to actual experiment. The difficulty was, of course, to get a number of ladies, some of whom wore corsets, some of whom did not wear corsets, and some of whom had never worn corsets, altogether under similar conditions in a state of strong respiratory activity. I managed this in the following way, and I asked a young lady, whom for brevity I will call Miss X and who is a noted hockey player, being an "international," to arrange it for me. A club to which she belonged was going to play against the Cambridge team and I was invited not only to watch the match but was attached to the umpire with perfect liberty to move about the ground and make whatever observations I wished. Miss X obtained for me complete information about the garments then and previously worn by the members of her team; indeed, the young ladies themselves knew I was watching them over the matter of corsets, but thought that I was simply engaged in noting whether the corsetted or uncorsetted displayed the greater activity. Miss X alone knew that I was observing the respiratory movements, and she managed at the intervals to gather the team together in conversation, so that my observations should be facilitated. All the young ladies were clad in close jerseys and short skirts that fitted evenly on the hips, hence the pectoral and abdominal movements were easily observed. Now most of the team wore corsets in ordinary life, but some played with and some without corsets. One young lady in particular had never worn corsets at all, and it is needless to say that I kept her under most special notice. The result, however, was as I anticipated—in all instances the breathing was pectoral and not abdominal, and there was no difficulty

under the circumstances about noting the facts. Hence I am of the opinion that Hutchinson was in error, and this being so, any argument based on his assertions falls void. I may add that Miss X herself—and she is well known as an athlete—had tried playing without corsets, but had found she did better when resuming them. The corsets she wore were short "riding corsets" with the bones taken out; in fact, they embodied simply the loin band that I have stated to be essential.

Dr. Fish asks another very pertinent question, although he associates it with a jest about babies. At what age is it advisable to begin wearing a corset? A consideration of the grounds on which I have stated corsets to be necessary supplies the answer. During development and growth the viscera are not liable to lapse, and the abdominal walls in youth are invariably competent. Therefore I am of opinion that corsets, physiologically considered, are never actually required before adult life. They are not positively necessary for a girl before the age of 16 or 17, when the loin band becomes the means of hanging the skirts to the hips instead of to the shoulders. If a girl or a woman can do without corsets altogether, so much the better for them. I should be the last to advocate the cumbrance of humanity with anything unneeded. But the fact remains that sooner or later most women will gird the loins with benefit to themselves and one cannot get away from it.

Dr. Fish makes another statement which also calls for comment when he says that a woman cannot fasten her corset in its usual dimensions when she takes a deep inspiration. All I can reply to this is that the corset concerned is not a correct one inasmuch as it compresses the ribs. I can simply repeat that the only tight part of a corset should be the loin band, and that the other parts of the modern corsets are perfunctory except in special instances.

Dr. James Kirkland's letter obviously also deals with corsets of the same faulty type, and it is therefore valuable in this respect because it exposes the errors of the æsthetic as contrasted with the physiological corset. But his arguments, which are based on the faults of the former, cannot be regarded as cogent against the latter. The most astounding statement, however, in Dr. Kirkland's letter is his assertion (and I know not on what grounds) that uncivilised women do not breathe pectorally, as do the women of civilisation, but breathe as men do. If Dr. Kirkland's statement is correct and he can substantiate it, it would introduce an entirely new factor into the theory of respiration. It is impossible for me to offer in so short a time any experimental contradiction, as one cannot collect in London a bevy of nude Zulu girls for a game of hockey. But I have written to a friend of mine who is a doctor (and who has just gone out to South Africa, to investigate, amongst other things, the sleeping sickness), asking him to clear up this very important matter.

So much, then, for the question of abdominal support as far it concerns women, but in my previous letter I made some slight allusion to the girding of the loins by men as being an indication that they also in heavy exercise found some support useful to the lower abdomen, and especially so in hot climates. The matter was quite a subordinate one, only it led to a letter from Colonel H. E. Deane (R.A.M.C., retired), who controverts my statements. Colonel Deane insists that the native Indian when girding his loins only tucks his loin cloth out of the way, and in no way uses it for purposes of support, as I have stated. I have referred this matter to an Indian gentleman who practises as a doctor in London and with the suavity of the East he informs me that we are both right. The native, he tells me, of course tucks his loin-cloth out of the way of his work, but he also tightens it round his loins and in particular supports his scrotum. I made a similar assertion about the Arabs, and this, again, Colonel Deane contradicts. I cannot do better, perhaps, than once more quote from the address of Professors Roy and Adami on this matter of girding the loins: "Thus is to be explained the employment of tight belts by gymnasts and modern athletes. This use has been recognised from the earliest times. Thus in 1 Kings xviii. 46 (and elsewhere) Elijah is said to gird up his loins. The word for girding up is, we are informed by Professor Robertson Smith, best rendered *fortiter constrinxit*—tightly constricted. Similarly the Greek expression for an active man—*εὔζωνος*, well girt—arose from a like conception. The Romans had a corresponding phrase, and eventually amongst all these nations, as among the Arabs of the present day, a loose girdle or belt when in public places was looked upon as a sign of want of vigour." I think I prefer to accept this statement rather than that of Colonel Deane. But Colonel Deane fires off his final shot of contradiction with the ejaculatory sentence, "Fancy a Marathon runner running in an abdominal belt!" Well, native Indians and native Arabs may not be easily accessible, but Marathon runners are. Mr. C. W. Gardiner, who beat Dorando the other day, and did the Marathon course in record time, was kind enough to give me all the information I required. Mr. Gardiner tells me that, except when actually racing, he always wears a flannel belt 10 inches wide. Runners, he says, should always wear such a belt at such times as it strengthens the loins. When actually racing he discards the belt because it would be in the way, and wears instead a band with a suspensory support for the testicles; and, adds Mr. Gardiner, no man or youth should run without them. By wearing them you have more freedom when running and are not likely to get a rupture in that part. I commend these facts to Colonel Deane.

I am, Sirs, yours faithfully,

Jan. 10th, 1910. HEATHER BIGG.

## THE INDICATIONS FOR OPERATION.

*To the Editor of* THE LANCET.

SIR,—I should like emphatically to endorse Dr. Leonard Williams's protest against Mr. Moynihan's claim that operation for duodenal ulcer can be undertaken without physical examination. I have been engaged in the making of post-mortem examinations for the last ten years. We are often told now that the "results of necropsy are to be controlled by those of biopsy." Unfortunately a necropsy occasionally follows the biopsy somewhat speedily, when the control is exercised in the opposite direction. More than once it has been my lot to find that a normal duodenum has been operated upon.

"It is not necessary to the attaining of an accurate diagnosis that an examination of the patient should be made." This is the spirit which leads to the not infrequent performance of gastro-jejunostomy for the gastric crises in tabes, and even, as I can vouch, for the dyspepsia of phthisis. It is a spirit which, if persisted in, would dispose of the claims of surgery to be a science.

I am, Sir, yours faithfully,

Welbeck-street, W., Jan. 10th, 1910. W. LANGDON BROWN.

## THE PARLIAMENTARY REPRESENTATION OF THE EDINBURGH AND ST. ANDREWS UNIVERSITIES.

*To the Editor of* THE LANCET.

SIR,—I think it only right to point out that your Scottish correspondents' information is misleading. It is perfectly true that some of Sir Alexander Simpson's personal friends very much regret that he has come forward, but that is because they are active supporters of Sir Robert Finlay, and they recognise that Sir Alexander Simpson is about the strongest candidate the other side could put forward. Your correspondent is surely unaware that it is one of the justifications of University representation that men who are not politicians in the ordinary sense thus find their way to Parliament. In the past Edinburgh and St. Andrews have had such representatives and Sir Alexander Simpson's supporters hope to have one again.

In considering the details of the social reforms which, whatever party is in power, are sure to be brought forward at an early date, Sir Alexander Simpson's long experience of medical practice should prove invaluable.

I am, Sir, yours faithfully,

Edinburgh, Jan. 11th, 1910. NORMAN WALKER.

## THE DANGERS OF INFECTED EARS.

*To the Editor of* THE LANCET.

SIR,—"For every child who dies from a blow, a thousand die from the effects of neglected ear disease." The above is an extract from an article in one of the daily papers, and is the first forcible allusion that I have seen in the daily press to a matter that is of great importance to the community. Whether the writer of the article referred to was fully justified in this remark or not, the consequences of neglect

in suppurative otitis are often very serious and by no means generally understood. It seems to me a matter for regret that certain aural surgeons have not yet recognised the immense value of proper intrameatal treatment, for I have shown by results that nearly every case of suppurative otitis may be cured by intrameatal treatment, if that be adopted before coarse lesions of bone or infection of brain has taken place.

It has been said that cases treated by otectomy would probably relapse, but though I have seen several of my old cases this year every one of these was in a perfectly satisfactory condition. I have, however, seen several cases in which the radical mastoid operation had been performed in which infection of the cavities concerned persisted or had recurred. I am aware that much of the syringing that is carried out in aural disease is ineffectual, but when proper cleansing of the middle ear is done good results may be confidently expected. The radical operation should only rarely be required. I am, Sir, yours faithfully,

Jan. 4th, 1910. F. FAULDER WHITE.

## DERMATOLOGY IN RELATION TO GENERAL MEDICINE.

*To the Editor of* THE LANCET.

SIR,—It is a great source of pleasure to read your leading article on dermatology and its relation to medicine of the present day. For many years past dermatology has been put in the background in the various sections of medicine. Why, we elder dermatologists know not. The British Medical Association at their annual meetings have sometimes omitted the section of latter years. Those of us who know anything of dermatology meet every day in our private and hospital practice many errors in diagnosis—for instance, scabies for eczema, eczema for scabies of some years' standing sometimes, psoriasis for eczema or lichen, herpes for syphilitic eruptions, &c. It is a great pity that in the leading hospitals and schools more attention is not paid to the *diagnosis* of skin diseases, for without diagnosis what is the use of treatment? There is another thing, we are increasing the nomenclature of our section with words of many syllables as epidermolysis bullosa, and so on. It is not easy for students to understand all these new names. I am of opinion it would be of much advantage to students if at least one question on dermatology and a few cases for diagnosis were put before them at their examinations. Why should the section be left out in examinations, when much attention is paid to the eye, ear, throat, chest, and other affections? As you say in your article, skin affections are indicative of certain constitutional affections, such as gout, diabetes, and various tropical diseases. Dermatologists have much to contend against in quack medicines and beauty shops. It is high time the authorities looked into these matters.

I am, Sir, yours faithfully,

JAMES STARTIN,
Senior Surgeon to the London Skin Hospital.

Stratford-place, Jan. 10th, 1910.

THE WATERS OF BATH.—Sir James Dewar, who has been experimenting for some years with the hot mineral waters of Bath, announces that krypton and xenon, which Professor Moureu and Professor Lepage have discovered in the waters of Aix-les-Bains, Saint Honoré, and some other French springs, have been separated from the gases given off from the King's spring at Bath.

NINTH CONGRESS OF THE GERMAN SOCIETY FOR ORTHOPÆDIC SURGERY.—The ninth Congress of the Deutsche Gesellschaft für Orthopädische Chirurgie will be held in Berlin (at Langenbeckhaus, Ziegelstrasse, 10/11) on Tuesday, March 29th, the day before the meeting of the German Surgical Society. An invitation has also been received by the society from the Bureau des Volksheilstättenvereins vom Roten Kreuz for its members to make an excursion free of cost to Hohenlychen (Uckermark) to inspect institutions there for tuberculous children and other institutions. Full particulars may be obtained from Dr. Georg Joachimsthal, the President for 1910, Genthinerstrasse, 16, Berlin, W.35.

## THE END OF THE WINE WAR IN FRANCE.

(FROM OUR SPECIAL SANITARY COMMISSIONER.)

THE wine war in the South of France is probably not yet forgotten, though the interests involved did not affect English consumers to any considerable extent. To-day the wine war and the distress it occasioned are happily terminated, and this by the advent of unusual prosperity. The distress leading up to fatal riots affected four departments and reached the climax in 1904. The yield of wine in France amounted during that year to 69,000,000 hectolitres; and, according to the returns of the Ministry of Agriculture, the value of wine fell in the department of the Aude to 5 francs the hectolitre, 8 francs in the Gard, 6 francs in the Hérault, and 11 francs 95 centimes in the Pyrénées Orientales. A vine called Aramon had been planted which yielded an enormous amount of grapes, but the wine made from this grape soon turned sour because it only contained 6 per cent. of alcohol. The wine growers therefore added sugar. The amount required was equal to three and a quarter pounds of sugar for every degree of alcohol per hectolitre of wine. It is regrettable to have to record that this practice was encouraged by the authorities. The tax on sugar, which was £2 11*s.* 3*d.* per 100 kilogrammes (2 hundredweight), was reduced to 19*s.* 3*d.* when the sugar was used for making wine. But the wines from the South of France are mainly employed for mixing purposes and sugared wines do not mix well, so that, after all, these wines did not find favour. Then the Brussels Convention of Sept. 1st, 1903, reducing the duty on sugar to £1 further dislocated the trade in sugared wines. The cheaper sugar so increased the production of these wines that the prices dropped to the figures given above for the year 1904. The next year the prices were lower still. Then the very men who had employed sugar wholesale, raised the cry of "death to the adulterators," and the Government was urged to prevent these evil practices. Some four years have now elapsed and the Government has had time to take action. As a consequence the sugaring of wine has been well-nigh abolished, the processes of making wine improved, and the reputation of the four departments to a large extent rehabilitated. In the debate that recently took place in the French Chambers it was claimed that no less than 20,000,000 hectolitres of artificial wines had been eliminated. The ordinary red wine used to be sold at 1 franc or 1 franc 10 centimes per degree of alcohol per hectolitre, and therefore the price for some years has not been higher than from 8 to 10 francs the hectolitre. But last year, what with a slight shortage in the output of wine and improvement in the wine itself, there has been a great rise in the prices. The output for the four departments showed a decrease of 5,725,000 hectolitres, and now the cheapest red wines are selling at 14 francs and 15 francs, the pink wines (*vins rosés*) at 17 francs to 18 francs, and the white wines at 20 francs and even more than 20 francs the hectolitre. As this is estimated to equal an average increase of 5 francs per hectolitre and the vintage this year yielded 25,000,000 hectolitres in the four departments, the consequence is that 125,000,000 francs or £5,000,000 more money has been received in these four departments during last year. This is enough to efface many a bad debt and remove many a grievance. The Government interference in preventing adulteration has therefore benefited, and not injured, the trade.

All these details should be of great interest to the advocates of the policy with regard to alcohol which considers that the cause of temperance is served by the use of light wines. The controversy on the question is mainly confined to the effects produced by what the people drink, and is not extended to the effects that would result if the law prevented the sale of adulterated drink and facilitated the sale of what continental reformers qualify as hygienic drinks. In Bavaria it has been a criminal offence for now more than 500 years to make beer with anything else but malt, hops, yeast, and water. Excessive drinking of Munich beer may produce obesity and other physical ailments, but it does not seem to cause alcoholism as we know it, while alcoholism does not prevail in those native populations that have natural wine for their daily

drink. For instance, in France there is drunkenness in Brittany, Normandy, Picardy, and the north generally because these are non-wine-producing provinces, and the habit of drinking spirits was contracted before railways rendered it possible to obtain cheap wine. Drunkenness, insanity, and crime increased throughout France when the phylloxera destroyed the vintages and the consumption of spirits consequently increased. Now the vines are reconstituted the supply of pure wine is abundant, and we have Algeria, South Africa, Australia, California, not to mention many European countries besides France, to supply cheap light wines. But wines offered at even 1*s.* a bottle are of no use to the temperance cause. A man, especially a workman engaged in manual labour, requires at least a bottle a day and certainly cannot afford a shilling a day, and therefore he will get the equivalent amount of alcohol in a cheaper but an injurious form. In France, however, we now have four departments rejoicing in unprecedented prosperity and the wine war happily concluded because they can sell an ordinary red wine at 15 francs the hectolitre. This means 100 litres for 1500 centimes, or one litre for 15 centimes, or 1¾ pints for 1½*d.* That is less than 1*d.* for an imperial pint. Indeed, a pint is only a little more than half a litre—namely, 0·568 litre—so that the wine costs hardly more that ¾*d.* the pint even at its present enhanced price.

The inference to my mind is that it should be possible, if we allow 100 per cent. for profits and transport, to retail natural ordinary wine in England at from 1½*d.* to 2*d.* a pint or 3*d.* a litre to the great gain of the population. The ordinary pure light red wine may be qualified as a hygienic drink and has been allowed admission in France *octroi* free as a means of promoting temperance. Why cannot such wine be available for the poorer sections of the population in this country? We have seen how, in the cause of temperance, the Paris municipality removed the *octroi* or town dues on wine, though this entailed a sacrifice of £2,000,000 per annum.[1] Thus the Parisians were able to buy wine at 2*d.* the litre retail price; and, by having wine so cheap, the consumption of spirits and the consequent prevalence of drunkenness has decreased. From a grocer's shop in Paris we obtained a litre of wine for 2*d.* and it came from the department of l'Aude. Analysed in our laboratory, this wine had the same composition as high-class and expensive clarets. There is no chemical difference between dear and cheap claret. The cheap wine is new, and from an ordinary vintage; the dear has been stored for some time and comes from a celebrated vintage, which gives the wine a special bouquet, and is dear because there is but a limited supply. We ought to be able to get in England wholesome wine at very low prices. As matters now stand, these cheap wines are charged 3½*d.* per litre Custom dues. The French colony in London seeks to obtain *vin ordinaire* for meals and the cheapest retailed costs 7*d.* the litre, which is cheap enough for the middle classes but still too dear for the working classes. If what occurs in other countries may be relied upon, a valuable way of promoting the cause of temperance would be to provide the populace with the opportunity of buying sound *vin ordinaire* at bottom prices.

## LIVERPOOL.

**(FROM OUR OWN CORRESPONDENT.)**

*Liverpool Workhouse Hospital: Strictures by Sir Henry Burdett; Indignant Guardians.*

THE recent article in the *Hospital* by Sir Henry Burdett condemning the Liverpool workhouse hospital gave rise to an animated discussion at a meeting of the workhouse committee on Jan. 7th, when Sir Henry Burdett's unofficial report, together with the official report of Mr. Arthur Lowry, the Local Government Board inspector, came under review. Mr. Edward Horrigan, who opened the discussion with a review of both reports, said that the report by Mr. Lowry was the most important document placed before the committee since the report of Mr. Jenner-Fust in September, 1894, on the accommodation of the workhouse. In discussing the report of the Local Government Board inspector he said that he could scarcely refrain from referring to the unofficial report which appeared in the *Hospital* and had been extensively quoted in the *Liverpool Daily Post and Mercury*. He had heard during the past week this report by Sir Henry Burdett rather variously described. One gentleman had described Sir Henry Burdett as a "hospital crank," and another as a "statistical faddist," while the *Daily Post and Mercury* referred to him somewhat disparagingly as a "touring London journalist." He did not think any of these descriptions did Sir Henry Burdett justice, seeing that he was considered to be one of the highest authorities on hospital construction, hospital management, and hospital accounts. It was because he was such an authority, and had enjoyed up to the present such a high reputation in the hospital world, that the guardians had been shocked to find him indulging in the language with which he had characterised the famous old hospital with which they were associated. From the Liverpool workhouse hospital had emanated most of the reforms which had been effected during a number of years in the direction of alleviating the sufferings of the sick poor. Perhaps the most important of those reforms, one which stood out in the history of England very prominently, was initiated by their late colleague Mr. William Rathbone, the introduction of the trained nursing system, which had since been adopted almost universally throughout the workhouses of the country. In his report Sir Henry Burdett seemed to have lost his ordinary sense of perspective. He had placed the Brownlow Hill workhouse hospital in juxtaposition with the Liverpool Royal Infirmary, one of the most modern and almost perfect hospitals, and the workhouse hospital had naturally suffered by comparison. Probably Sir Henry Burdett had also in his mind's eye the recent completion of the Manchester Royal Infirmary, which had cost, site included, over £500,000, or £800 a bed. There was one feature of Sir Henry Burdett's report to which special reference ought to be made as it had shocked the moral susceptibilities of the citizens of Liverpool. From the report the average reader might jump to the conclusion that the female lock and maternity wards were hopelessly and inextricably mixed up together. He need not assure the committee or the citizens of Liverpool that such a state of things did not exist at Brownlow Hill. If they did exist, the members of the committee would deserve execration and hounding out of public life. They, however, who knew something about the various sections of the workhouse hospital were aware of what was in Sir Henry Burdett's mind. The workhouse hospital could not select its cases like an ordinary hospital, and it had to be, so to speak, a "pathological refugium peccatorum," both the refuge of sinners and occasionally the hospital to which virtuous wives, suffering from no fault of their own but through vicious husbands, had to come. It would be monstrous to consign the innocent as well as the guilty to the lock wards. Regarding the efficiency of the maternity wards, he had the authority of the lady superintendent of nurses (Miss Stewart), one of the most conscientious and able officials working under the Poor-law, that no such case of contagion as Sir Henry Burdett had suggested had ever come under her notice in her 24 years' service. The committee would probably recall that Mr. William Alexander, the visiting surgeon, contributed to THE LANCET an article on the Brownlow Hill workhouse infirmary, in which he showed that in 401 maternity cases only three deaths occurred, or 0·74 per cent. These three cases were all characterised by serious complications which often lay beyond the most advanced medical science. Reverting to the text of Sir Henry Burdett's report in the *Hospital*, Mr. Horrigan admitted that the floors of the workhouse infirmary were old, but the committee had quietly and unostentatiously been engaged in effecting many improvements. Sir Henry Burdett's remarks on the interior brick walls could be passed by as hypercritical. The mattresses had given Sir Henry Burdett a good deal of concern, but the committee could view with equanimity his proposal to sentence them for life to fibre mattresses and flock pillows. Hair mattresses and feather pillows were above the standard which the general body of ratepayers could afford for themselves, but in the case of very serious illness in the workhouse infirmary it might be possible to make such patients more comfortable in respect of bedding. Regarding the official report of the Local Government Board inspector—nothing being set down except what had

[1] See THE LANCET articles on "Temperance Legislation in France," March 10th (p. 709) and 24th (p. 865), and April 7th (p. 995), 1906.

been actually deserved—there were many things mentioned which the committee must seriously take in hand at once. Miss Thorburn, one of the lady guardians, in a temperate and sensible speech, replied to Sir Henry Burdett's attacks on the workhouse hospital. The sanitary arrangements, she said, about which charges had been made, were quite satisfactory. As to the mattresses and beds, she had got the master of the workhouse to send her one. She had slept on it for two or three nights and found it very comfortable indeed. Mr. Arthur Lowry, Local Government Board inspector, said he was glad to attend the meeting of the committee, but his pleasure was a little dashed by seeing the report of Sir Henry Burdett. He rather dreaded the frame of mind that this report might have produced amongst the committee, and he must congratulate them upon the way in which they had taken it. The dignified manner exhibited by the ladies and gentlemen who had commented on the report of Sir Henry Burdett was an example to any board of guardians or other local authority which might be similarly attacked. With respect to Sir Henry Burdett's report there was, of course, a substratum of truth in it and honest purpose. The basis of the whole matter was that they had at Brownlow Hill a comparatively small area of ground, a very large number of persons, and buildings to a great extent very old. Sir Henry Burdett probably did not know—at any rate he did not make any references to the fact—that the select vestry had to consider the ratepayers and that they were saddled with antiquated buildings. He was probably unaware of the large sums which the select vestry had spent in recent years in producing buildings for the children and also hospital buildings, which would compare very favourably even with buildings erected at something like the enormous sums mentioned by Mr. Horrigan. They knew that he did not think highly of Brownlow Hill, but they knew also that he believed that the very best was being made of the old buildings there. Mr. Lowry said that he could not help thinking that Sir Henry Burdett's pen had led him astray in the matter of the maternity wards.

*Liverpool School of Tropical Medicine: Colonial Office Assistance.*

Representations having been made to the Colonial Office with regard to the necessity for expansion of the Liverpool School of Tropical Medicine, immediate steps have been taken, with the assistance of that Office, to start the following four new lines of research work—viz: (1) researches on malaria; (2) a detailed bibliography of malaria, the literature of which has grown so enormously during the last ten years (being in ten different languages) that it requires thorough classification; (3) researches on various points of parasitology; and (4) researches on pathological chemistry. In addition, the school is enlarging the staff of the Runcorn Research Laboratories and is continuing the work there.

Jan. 11th.

## SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

*Queen Victoria's Jubilee Institute for Nurses: Scottish Branch.*

THE annual report of the Scottish Council of this organisation has just been printed. The report refers with much regret to the loss of several members of council during the year. The superintendent of the institute has been relieved of her duties in connexion with the training home as the national work has so increased that it requires her whole time. Miss Cowper, superintendent of the Scottish branch, has had the gold badge conferred upon her, and Miss Philp has been appointed superintendent of the training home with two district superintendents under her. The number of affiliated branches is now 207. Many of the affiliated branches have been asked by county authorities to allow theirnurses to assist the medical officer in the inspection of school children. Where possible this has been allowed, but the work is still in its infancy, and it is impossible to say what the future of it may be. The children requiring continued home attention would probably in any case become their patients. In Edinburgh and Leith during the year 5516 cases have been attended to by the nurses; of this number 544 died. As in former years, the greatest number of patients has been sent by medical men. Of the cases attended 1732 have been medical, 1146 surgical, 492 gynæcological, 1589 obstetrical. The report says that "the serious amount of unemployment unfortunately prevalent in the city has greatly aggravated the distress which sickness inevitably brings to a working-man's house. This is especially sad as affecting the class who are steady workers when employment is to be had. One regrettable result is that many mothers of families are now the chief breadwinners, and a great strain is thereby put on the health of women and children." This condition of things has added to the anxiety and difficulties of the nurses. With regard to finance, there is an excess of ordinary expenditure over ordinary income of £465. During the year 39 nurses have successfully passed through the six months' training in the home, and 38 of these have been engaged by local committees. The number of Queen's nurses on the Scottish roll is 323. During the year five new district nursing associations have been formed and affiliated to the institute.

*Dermatology and the Scottish Curriculum.*

With the conclusions of the leading article in THE LANCET of Jan. 1st dealing with dermatology in relation to medicine our teachers of dermatology can have no fault to find, but each of the four Scottish Universities has on its staff a lecturer in dermatology, and some of the statements made in the article do not apply north of the Tweed For at least 15 years the University of Edinburgh has required all candidates in the Final Examination to endeavour to diagnose three cases of skin disease, and over 10 years ago Dr. Allan Jamieson was appointed university lecturer on dermatology, and the class was placed on an equal footing as regards compulsory attendance with the classes of laryngology and diseases of children. According to the report of the University, just published, 180 persons graduated during the year, the students attending the class of dermatology during that period numbered over 100, excluding women who are taught separately. For over 20 years, until his retirement, Dr. Jamieson gave every Saturday morning demonstrations of cases to large numbers of students, and this practice is continued by his successor. You will see, then, that we in Edinburgh do, if anything, rather more than satisfactorily answer your question, "What, then, should be done?"

*Notification and Treatment of Pulmonary Tuberculosis in Glasgow.*

The corporation of Glasgow has notified all medical men in the city that for three years from Jan. 1st, 1910, phthisis has been placed on the list of notifiable diseases, and that medical practitioners and householders will have placed upon them a statutory duty of intimating to the medical officer of health all cases which may come to their knowledge. Notification, however, is but the first step in the campaign which the corporation are inaugurating against this disease, and what is practically a new branch of the public health service of the city has been formed to follow up notification by practical and medical measures. Acting under the medical officer there will be a special medical assistant who will investigate the causes of consumption in the city. Arrangements have also been made with the parish councils of Glasgow and Govan for consultation being held in the public dispensaries owned by these bodies. At each dispensary there will be in attendance a medical practitioner appointed by the corporation, who will make an examination of all cases presenting themselves and advise the patients as to treatment. In addition, there will be attached to each dispensary a trained nurse, who will visit selected cases in their own homes to see that the instructions of the medical advisers are being carried out. It is expected that notification will reveal the chief sources of infection, whether in the houses of the people or in connexion with their employment. The measures to be adopted will obviate interference with the individual worker already heavily handicapped by disease, but will indicate the various trades whose employees seem specially liable to the disease and in which sanitary improvement may be effected. Notification will also be valuable as a means of discovering insanitary conditions in association with the actual occurrence of the disease. In this direction there remains a great deal to be done towards the improvement of existing houses, quite apart from demolition schemes, and much good may result

from a systematic appreciation of the powers already possessed by the corporation which provide for the opening up of concealed beds and for the ventilation and lighting of dark lobbies. In Glasgow alone, it may be mentioned, 1300 deaths occur from phthisis per annum. Of course, the efforts now to be put forth are largely in the nature of an experiment, but if the scheme meets with the support which it deserves, both from the medical profession and the general public, it is believed that it cannot fail to result in the saving of valuable human lives and in supplying data on which to base further schemes of advancement and reform.

*Medical Staffing of Dundee East Poorhouse Hospital.*

Dundee parish council at its last meeting declined to approve of a recommendation by the poorhouse committee that two resident medical officers should be appointed for the East Poorhouse and Hospital at salaries of £120 and £100 respectively. The matter was remitted back to the committee with powers for further consideration.

*Peterhead Board and Medical Inspection of School Children.*

At a meeting of the burgh board last week the chairman submitted the scheme for the medical inspection of school children as revised by the county committee, and moved that the board accept the scheme. A motion to set aside this scheme was, however, carried, it being pointed out that the scheme was practically the same as the old one, except that there were to be a larger number of officials and that nurses were not to be insisted on. The clerk was instructed to write the secretary of the county committee with a view to have a local system instituted.

Jan. 10th.

## IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

*Dublin Hospitals Tuberculosis Committee.*

Dr. J. T. Daniel has presented a report to this committee in which he states that during the last three months he has made 36 visits to patients' homes and has treated 25 at his own house, besides seeing to the disinfection of the homes of three patients who had died. The report of the work done by the two tuberculosis district nurses in Dublin during nine months showed a total of 4939 visits paid to 297 cases, an admirable record of industry, which has been commended by the secretary of the Queen Victoria's Jubilee Institute of Nurses in a letter to Sir William Thompson, honorary secretary of the Tuberculosis Committee.

*Fees of Medical Witnesses.*

Dr. P. J. Macnamara of Kilmallock discusses the payment, or rather the *non*-payment, of the fees of substitutes in those cases in which medical officers are subpœnaed to appear as witnesses in civil cases. In a communication to the *Journal of the Irish Medical Association* he gives striking personal experiences in illustration of "the present intolerable position in which medical witnesses are placed owing to the action of the Local Government Board, who, while recognising the receipt of a Crown summons as a cause of legal incapacity, refuse to place a civil subpœna on a similar footing. In the old days both summonses were regarded by boards of guardians as creating a temporary incapacity, and substitutes were invariably paid." Still, he admits that (in case of the legal fee) even in those good old times, a doubt or difficulty about the payment of the medical witness was much more likely to arise when summoned at the civil side than in case of a Crown summons. In one of his own experiences he was obliged to take legal proceedings which resulted in the realisation by seizure and sale of a large rick of hay. Dr. Macnamara then subjoins the significant comment: "Imagine a country practitioner in troubled times being driven to such extreme measures!" The following is an example. A medical witness received "the usual viaticum of £1" for a day's attendance at a court situated at a distance of 20 miles. The board of guardians refused at first to pay the substitute; but as that position could not be maintained, they resolved to deduct the amount from their medical officer's salary! An appeal to the Local Government Board was met by the equally considerate concession that "if the guardians were good enough favourably to consider the matter and not deduct the amount from his salary they would not object." All practitioners must, I think, agree with Dr. Macnamara that the position is an intolerable one. He suggests two modes of escape. The first is take no notice of the subpœna, if the fee of the practitioner and of his locum-tenent be not paid therewith, the liabilities incurred being "contempt of court," or action for damages on the part of the litigant. The second is to attend court and to make a respectful appeal to the judge on being called. "Should the judge refuse to make an order for the necessary fees then steadfastly refuse to be sworn." Dr. Macnamara states: "I am no longer young, but I am fixed in my determination to adopt the latter course should occasion require. Imprisonment for contempt of court is no disgrace."

*Marked Improvement in the Health of Belfast.*

The report on health presented to the monthly meeting of the Belfast city council on Jan. 3rd showed that between Nov. 21st and Dec. 18th, 1909, there were notified two cases of enteric fever, 59 of scarlet fever, 3 of simple continued fever, 15 of diphtheria, 2 of membranous croup, 35 of erysipelas, and 79 of pulmonary tuberculosis. There were 41 deaths from zymotic disease (a rate of 1·5), 59 from phthisis, 114 from diseases of respiratory organs (exclusive of pneumonia), and 50 from pneumonia. The death-rate from all causes was 23·9. The death-rate both from chest diseases and zymotic affections keeps high. The following tables are interesting as showing that there is an improvement in the public health of Belfast:—

*Table Showing the Number of Cases of Infectious Diseases Notified during the Year 1909 (as Calculated on the Number Notified During the 50 Weeks ended Dec. 18th, 1909), as Compared with 1906–7–8.*

| Year. | Typhus fever. | Typhoid fever. | Scarlet fever. | Simple fever. | Puerperal fever. | Small-pox. | Diphtheria. | Membranous croup. | Erysipelas. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1909 | 6 | 109 | 333 | 46 | 23 | — | 196 | 8 | 251 | 972 |
| 1908 | 19 | 274 | 323 | 208 | 22 | — | 221 | 27 | 294 | 1388 |
| 1907 | — | 356 | 531 | 270 | 29 | 1 | 257 | 37 | 341 | 1822 |
| 1906 | 9 | 551 | 1193 | 366 | 17 | — | 233 | 40 | 340 | 2749 |

*Table showing the Number of Deaths and the Average Annual Death-rate per 1000 of the Population from all causes, Zymotic Diseases, Typhoid Fever, and Phthisis, during the Year 1909 (as calculated on the Number of Deaths Registered during the 50 weeks ended Dec. 18th, 1909), as compared with 1906–7–8:—*

| Year. | All causes | | Zymotic diseases. | | Typhoid fever. | | Phthisis. | |
|---|---|---|---|---|---|---|---|---|
| | No. | Rate. | No. | Rate. | No. | Rate. | No. | Rate. |
| 1909 | 6959 | 18·0 | 504 | 1·3 | 21 | 0·05 | 812 | 2·1 |
| 1908 | 7523 | 19·5 | 689 | 1·8 | 57 | 0·15 | 880 | 2·3 |
| 1907 | 7870 | 21·3 | 615 | 1·7 | 82 | 0·22 | 926 | 2·5 |
| 1906 | 7379 | 20·1 | 905 | 2·5 | 90 | 0·24 | 1015 | 2·7 |

This table shows a reduction in the general death-rate, in the zymotic rate, in that from typhoid (which formerly was the highest of the large cities in the United Kingdom), and from phthisis. Infantile mortality was 135 per 1000 births, while in 1901 it was 154, in 1905 it was 136, and 147 in 1908.

*Gas-poisoning in Belfast.*

For some time past great anxiety has prevailed in Belfast in reference to the quality of the gas, which is a mixture of coal and "water" gas. Before Christmas two deaths occurred from it, and on Jan. 7th another took place, the victim being an alderman of the city corporation, Mr. John Rooney, who was found dead in his bed, with a strong smell of gas in the room, the leakage being caused by some fusing between an electric-light wire and the gas-pipe. At the inquest on Jan. 8th the coroner (Dr. James Graham) said it was his intention to have an inquiry into the whole

circumstances of the case, and in the meantime he had instructed two experts, one to make an examination of a dog of the deceased found dead under the bed and the other to tell the exact composition of the gas. They had such a number of these gas-poisoning cases in Belfast that he thought it was his duty, as well as that of the jurors, to investigate the case, with a view of seeing if anything could be done to prevent gas-poisoning in their city. From evidence given at the inquest, which has been adjourned to Jan. 13th for the presence of the experts, it appears that a gas-pipe ran from one side of the room to the other (where the deceased lay down for an afternoon nap), and parallel with it, at about a distance of 4 inches, was an electrical wire covered with metal sheeting. From the gas-pipe a branch led to a gas-jet, which was burning. The electrical wire went over that branch, touching, or almost touching, it. At the point of contact there was a hole in the gas-pipe, which was actually melted away about 3 inches. The under side of the flooring was scorched. What the public of Belfast demand to know is: (1) how much percentage of carbon monoxide there is in this gas, so as to see whether or not it exceeds the amount allowed by statute; and (2) why it is that the combination of gas-pipes and electric-light wires has of late led to so much serious trouble. There is great uneasiness on the whole question in the city of Belfast, and it is hoped that this deplorable accident, by which a prominent citizen has lost his life, will tend to remove it by clearing up many debateable points.

Jan. 11th.

## PARIS.

### (FROM OUR OWN CORRESPONDENT.)

*Action of the Bile on the Putrefaction Toxins of the Intestine.*

M. Roger considers that although the bile possesses no antiseptic properties it is nevertheless capable of acting on the putrefaction toxins of the intestine. Two flasks, of which one contained pure bouillon, while the other contained bouillon with the addition of a fifth part of bile, were incubated after inoculation with human fæces. Microbial growth was rapid and abundant in both flasks, but in the one containing bile the odour was less marked than in the other. When intravenous injections from each flask were given to rabbits it was found that on an average the fatal dose from the flask containing pure bouillon was 4 cubic centimetres per kilogramme of the animal's weight, whilst the fatal dose from the flask containing an admixture of bile was from 12 to 33 cubic centimetres per kilogramme—i.e., from three to eight times as much. The bile acts not by neutralising toxins that have been formed but by hindering their formation. If a culture which has been grown in pure bouillon receives an admixture of bile its toxicity is not diminished but increased, because the deleterious action of the bile is added to that of the microbial poison. The anti-putrescent constituents of the bile resist boiling and are soluble in alcohol, the cholesterine being apparently inactive. These experiments supply an explanation of certain constitutional symptoms in the cases in which the discharge of bile into the intestine is interrupted.

*State Relief in Old Age and Sickness.*

The General Council of the Seine has recently approved a report on the systematic relief of persons suffering from old age or infirmity, including incurable conditions. A grant of 15,582,000 francs has been sanctioned for the relief of such persons domiciled in the communal area of Paris, their number being estimated at 49,000 for the year 1910. Similarly for those who are domiciled not in the communal area but outside it, in the banlieu, a grant of 1,000,000 francs has been sanctioned to be disbursed in 7343 monthly payments.

*Bread-making by Machinery.*

The Council of Hygiene has had under consideration the question of the use of machinery for kneading bakers' dough. The subject came before the Council in consequence of a formal expression of opinion to the effect that the danger of infection from the use of bread made in the ordinary way by tuberculous bakers had been proved, and that it would, therefore, be an act of kindness to warn the public against this danger and to make it known that the best possible precaution was the use of bread which had been kneaded by machinery. The Prefect of the Seine thereupon commissioned Professor Laveran to advise the council as to the reality of the alleged danger and as to the measures which it might be desirable to take. Professor Laveran first set himself the task of determining whether the danger really existed and whether bacilli introduced into the dough by a working baker suffering from manifest tuberculosis remained virulent after the dough had been baked. His experiments proved that the temperature of 100° C., which was always reached even in the centre of a properly baked loaf, was quite sufficient to kill the bacilli of tubercle; the ordinary acidity of the dough was also favourable to the destruction of these organisms. It must not, however, be concluded from this that the employment of tuberculous persons in bakehouses was without danger and that no action need be taken. The tubercle bacilli killed by the process of baking were incapable of producing tuberculosis in the consumer, but they were not therefore absolutely harmless, as they might produce irritation and local inflammation of the intestinal mucous membrane. Moreover, the bread after coming out of the oven might be soiled by handling or by contact with dust infected with tuberculous sputum which had dried on the floor. Professor Laveran then pointed out that the hand kneading of bread, in addition to being an unappetising spectacle for the beholder, was also very laborious for the baker. He therefore strongly recommended that kneading machines should be introduced for the purpose of preventing the contamination of bread by tuberculous workmen, and in the next place that the attention of bakers' associations and master bakers should be drawn to the danger resulting from the employment of tuberculous persons in bakehouses and to the necessity of taking proper precautions. He also said that there ought to be an active sanitary inspection of bakehouses; that the machine kneading of dough, which from the hygienic point of view was very superior to hand kneading, produced excellent bread; and that for this reason it was desirable that machine kneading should replace the old method as soon as possible. Professor Laveran thought that the courses of instruction established by the syndicate of Paris bakers deserved every encouragement; that more promptness should be shown in extending the public supply of electric power; that the administrative formalities in connexion with its introduction into bakehouses should be simplified; and that the minimum charge for electric current should be reduced.

*Monument to Dr. Péan.*

A monument to Dr. Péan, the celebrated Paris surgeon, was unveiled last month in presence of the President of the Republic. It stands in the Boulevard de Port Royal, not far from the hospital which was built at Dr. Péan's expense, and has taken its name of Hôpital Péan from him. The company were received at the hospital by the director, who is a son-in-law of Dr. Péan, the whole of the staff being present. The President of the municipal council, after having acknowledged the reception of the monument, delivered a eulogy on Dr. Péan. Succeeding speakers were the Prefect of the Seine, Dr. Pozzi, and Dr. Brochin, the oldest of Dr. Péan's assistants. The proceedings terminated with a discourse by Dr. Delaunay, surgeon to the hospital, who said that although Dr. Péan had irreconcilable enemies he also had admirers and warmly-attached friends.

Jan. 10th.

## BERLIN.

### (FROM OUR OWN CORRESPONDENT.)

*Statistics of the Medical Profession in Germany.*

ACCORDING to the Medical Directory, edited by Professor Schwalbe and quoted in the *Deutsche Medizinische Wochenschrift* by Dr. Prinzing, there are 31,969 medical men in Germany. As the population is 63,886,000 there are therefore about 5 medical men for each 10,000 inhabitants, the respective proportional numbers for each of the eight years from 1901 to 1908 being 4·92, 5·0, 5·06, 5·06, 5·08, 5·06, 5·06, and 5·02. The gradual decrease which commenced four years ago has accordingly been continued in 1909. Comparing other countries with Germany the report states

that in England there are 7·1 medical men for each 10,000 inhabitants, in Scotland 7·9, in Ireland 6·0, in France 4·9, in Italy 6·3, in Austria 4·1, in Denmark 5·2, in Norway 4·5, in Sweden, 2·4, and in Russia 1·8. England and Scotland have thus by far the largest proportion of medical men, a fact which Dr. Prinzing attributes to the preponderance in those countries of towns where, of course, medical aid is more in request than in country places. In Germany a considerable increase of the profession may be expected within the next few years, as the number of medical students, which was 6032 in 1905, rose to 9239 in 1909. It is true that this number includes more than 1000 foreigners who will eventually settle abroad, but the number of qualifications granted already begins to rise after having shown a considerable decrease. During the last four years the qualifications granted were 726 in 1905, 845 in 1906, 553 in 1907, and 827 in 1908. The distribution of medical men in the several states of the empire showed that there were 19,319 in Prussia, 3570 in Bavaria, 2294 in Saxony, 1061 in Würtemberg, 1272 in Baden, 745 in Hesse, 362 in Mecklenburg, 753 in Hamburg, and 917 in Alsace-Lorraine, the remainder residing in the smaller states. Comparing these numbers with those of the previous year it becomes obvious that in the eastern parts of the empire, where the population is mainly rural, there is a slight decrease, but in the western and southern parts a slight increase has occurred. The increase of the profession is seen specially in the towns of over 10,000 inhabitants—the number of medical men residing in such towns being 11,934 in 1906, 12,232 in 1907, 12,632 in 1908, and 12,932 in 1909, as compared with 18,997, 19,184, 19,008, and 19,037 respectively for the smaller towns and country districts. Of the larger towns, with populations of more than 10,000, Wiesbaden has far the greatest proportion of medical men—namely, 22·9 for each 10,000 inhabitants. This is due to the character of Wiesbaden as a watering-place and health resort. Next comes Munich with 16·2 medical men for each 10,000 inhabitants. For Strasburg, where there is a university in addition to a large garrison with many army medical officers, the corresponding proportion is 14·6. The same is the case for Kiel with 12·6 medical men for each 10,000 inhabitants. Berlin is in the fifth place with 12·4 per 10,000 inhabitants. For some other towns the proportions are 12·3 in Frankfort, 11·5 in Halle, 11·0 in Königsberg and Hanover, 9·7 in Dresden, 8·0 in Hamburg, and 7·7 in Nuremberg. It is remarkable that of the larger towns several have a very small proportion of medical men per 10,000 inhabitants, the figures being 5·1 in Barmen and Bochum, 4·8 in Essen, 4·7 in Plauen, 3·9 in Gelsenkirchen, and only 3 in Duisburg. These large towns, which are, comparatively speaking, little known to countries remote from Germany, have an essentially working-class population, and as the people for the greater part belong to sick clubs there are few openings for independent practitioners. Another remarkable fact is that 356 towns and villages which formerly had a resident medical man are now without one, and some have even been without one for four years or longer. In the beginning of the century the rapid overcrowding of the profession induced many medical men to settle in places where formerly no practitioner had resided, but on discovering that they were unable to make a livelihood there they went elsewhere, and no one took their place. The number of duly qualified medical women has risen from 55 to 69, of whom a great many reside in Berlin. The report deals also with the question of specialists, which is a subject of perpetual discussion in German medical circles, their number having increased in an astonishing degree. Fortunately, however, there is now a slight diminution. In the 39 larger towns 4004 specialists were registered in 1906, 4375 in 1908, and 4441 in 1909, being 3·37, 3·44, and 3·43 respectively for each 10,000 of the population, or 33·6, 34·6, and 34·3 for each 100 medical men. The record is held by Frankfort, where 42·6 per cent. of the medical men were specialists, as compared with 18·4 per cent. in Kiel. Far the greatest number of specialists—namely, 711—practised as gynæcologists, 492 devoted themselves to diseases of the eyes, and 463 to diseases of the larynx, the nose, and the ear. The Federal Council has lately decided to make a statistical classification of the medical profession, giving a variety of details in reference to specialists.

Jan. 10th.

## BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

*Lunacy among Jews.*

Dr. K. Kenéz, superintendent of the County Lunatic Asylum at Bihar, has submitted his annual report, which contains interesting statistics regarding the alarming increase of insanity among the Jews of the country. The superintendent says that "never before in the history of the insane in this country have so many Jews been adjudged insane. The figures show unmistakable evidence of increase in insanity and mental degeneracy in the Jewish race. It would take too long a description to attempt to explain all the causes to which the increase of insanity in the Jewish population may be due. The patients we get do not seem to owe their mental downfall to excessive brain work, but rather to physical conditions and degeneracy, to which their unhygienic methods of living naturally lead. Hereditary influences, too, are gradually asserting themselves as a not insignificant factor in producing additional physical and mental defects in the race." The number of Jewish patients sent to the hospital during the year was 60 more than in the previous year, showing an increase of 34 per cent. The total number of patients in the asylum was 1394, or 49 greater than the year before. The smallest number under care at any one time was 398 and the largest was 437.

*Typhoid Bacilli in the Gall-bladder.*

The great importance of the gall-bladder as a storehouse for germs of the typhoid group is pointed out by Dr. M. Gross in the *Orvosok Lapja* of Dec. 23rd, 1909. He says that many individuals who have come into contact with patients suffering from typhoid fever but are not themselves ill harbour virulent typhoid germs in their system, and are thus a menace to their surroundings. He found the bile altered in all cases of typhoid fever that came to necropsy, and typhoid bacilli were present even where the lower portions of the intestinal tract were free. It is reasonable to suppose that in many cases of typhoid fever the bacilli in the fæces are really derived from the gall-bladder. When typhoid bacilli were injected directly into the blood of rabbits (as was first observed by Forster in Germany) the germs could be found in the bile after six weeks, at a time when they had already disappeared from the blood and urine. They were also found in the upper duodenum, but not in the lower intestines. Even where the bile was sterile cultures could be obtained if pieces of the wall of the gall-bladder were incubated in an appropriate medium. The paratyphoid germs behaved in every way similar to the typhoid germs. The bacilli sometimes persisted very long after the termination of the disease. In one case the gall-bladder even continued to be infected for 20 years. There was very little that could be done under such circumstances, since neither the bile nor the intestinal contents admitted of sterilisation during life. The best course was to make repeated bacteriological examinations of the fæces in suspicious cases and to operate whenever a catarrh or the formation of a calculus seemed to be probable.

*Diagnosis of Early Tubal Pregnancy.*

At a recent meeting of the Nagyvárad Medical Society Dr. M. Konrad read a paper on the diagnosis of early tubal pregnancy. He said that during the last ten years he had operated in 14 cases of tubal pregnancy—namely, on ten after rupture and on four before rupture. Abdominal section was performed in all the cases in which rupture had not occurred. Among the ten patients in whom rupture had taken place the operation was suprapubic in seven cases and vaginal in three cases. All the patients recovered. All had demonstrable lesions sufficient to account for the arrest of the fecundated ovum in the tube. The results of gonorrhœal infection and minor post-puerperal lesions were most frequently noted as etiological factors. Early diagnosis and prompt operation were necessary in all cases. In the vast majority of cases a diagnosis could be made before rupture and the mortality would then be no higher than operations for appendicitis performed during a quiescent interval. In Dr. Konrad's cases almost all the patients had been seen by one or more medical practitioners before rupture occurred.

Jan. 10th.

## NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

*Conference on the Prevention of Infant Mortality.*

THE American Association for Study and Prevention of Infant Mortality was organised at a special meeting held at Yale University, New Haven, on Nov. 13th, 1909. The session was opened with an address by President Hadley, who spoke earnestly on the question of adequate means of protecting the children from the preventable diseases which create such an enormous mortality among infants. The discussion of subjects had a wide range and elicited a large amount of valuable and practical information in regard to the prevalence of contagious and infectious diseases in the cities represented which cause the largest percentage of infant mortality. The first session was devoted to the medical prevention of infant mortality, the second session was occupied with the philanthropic prevention of infant mortality, the third session discussed institutional prevention of infantile diseases, and the last session considered the educational questions to which the association must devote its resources.

*Health of the United States Army and Navy.*

The annual reports of the Surgeons-General of these branches of public service present some features of general interest. The health of the army force was unusually good. The constantly non-effective rate for the enlisted strength was 42·68 per 1000, as compared with 46·17 for 1907 and 49·79 for 1906. The highest death-rates were from tuberculosis, pneumonia, and typhoid fever. The antityphoid vaccination test in the hospital corps has been found so successful that the Surgeon-General recommends the extension of the vaccination to include volunteers from all organisations to be detailed for duty outside of the United States and among troops to be ordered for special practice or manœuvres. The general health of the naval force has shown improvement. The ratio of admissions and readmissions per 1000 of the strength for the year was 611, as against 630 for 1908 and 649 for the decade from 1897 to 1906. The cigarette-tobacco bag is suggested as possibly playing an important part in the transmission of mumps, as the invariable habit of those who use tobacco in this form is to close the sack by pulling the puckering string with the teeth, and thus the user of the sack may infect himself by applying his mouth to the saliva-soaked bag.

*A Public Health Bureau.*

The agitation which has been in progress several years for the establishment of a Department of Health in the Federal Government, with a Secretary of Health having a seat in the President's Cabinet, has taken form in the President's message to Congress. He states that a movement has been gathering strength, especially among the members of the medical profession, in favour of a concentration of the instruments of the national Government which have to do with the promotion of the public health. In the nature of things the Medical Department of the Army and also of the Navy must be kept separate. But there seems to be no reason why all of the other bureaus and offices in the general Government which have to do with the public health or subjects akin thereto should not be united in a bureau to be called the "Bureau of Public Health." While the position of the President in favour of a bureau instead of a "department" of public health will disappoint the "Committee of One Hundred," which has aimed to secure the latter rather than the former organisation, there is no doubt that the President has pointed out the wiser course of procedure because more practicable. There is a very strong prejudice in Congress against the creation of new cabinet officials by organising new "departments" in the general Government. And this is especially true of a "department" that in any wise might encroach upon what is recognised as "State rights," as a Department of Health would be liable to do in the management of quarantines and in its efforts to control the progress of epidemics. A bureau in the Treasury Department like that of the existing "Public Health and Marine Hospital Service" excites no opposition but on the contrary has become popular. It is apparent that the final outcome of the agitation will be the consolidation of all of the affiliated branches of the Government service, now scattered through the departments, into one well-organised and equipped public health service.

*The White Slave Traffic in New York.*

Intense public interest has been aroused by recent revelations of the traffic now carried on between the country and European States in the importation of young women for immoral purposes. The subject has assumed sufficient importance to be brought to the attention of Congress by the President. For the past two years the Immigration Commission has been investigating this traffic, and though its report has been made, it has not been issued, and only some of the more important facts have been made public. The so-called "white slave traffic" is carried on by "dive-keepers" and "procurers," who work together with similar agencies abroad at places of embarkation of emigrants and on board of the steamships. Innocent women form only a small percentage of the number entrapped, but procurers are on the watch everywhere to decoy unattended women immigrants. At the great immigrant dépot in New York these procurers find the best field for their occupation, and the commissioner has been active in his efforts to protect the unattended women immigrants, but under the present laws he has been unable to do preventive work at all adequate to the needs of immigrants. It is proposed to secure the passage of a law by Congress which will enable the Government to place special agents abroad and on steamers, and special matrons at every port of entry, obtain full names and other information of all women landing, power to hold any woman and investigate her destination and family, and the imposition of heavy fines for transporting persons from one State to another for purposes of prostitution.

Jan. 1st.

## NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

*Plague.*

THE plague returns for the week ending Dec. 4th show 4013 deaths, compared with 3734 in the preceding week. The Bombay Presidency reported 677; Madras, 77; Bengal, 115; the United Provinces, 1435; the Punjab, 731; Burma, 41; the Central Provinces, 431; Mysore State, 115; Central India, 136; Rajputana, 248. A report on the investigation recently carried on in the Central Provinces into the question whether plague persists in rats during the period of abatement of human plague has been issued. Captain G. Fowler, I.M.S., began work at Akola on May 27th, and ceased on August 14th, 1909. He selected the village of Somthana as his control. It lies four miles from Akola. During his investigation he examined 5888 rats, of which 5696 were trapped in Akola and 192 in Somthana. None of the rats examined presented any of the microscopic appearances of plague infection. At Akot Hospital, Assistant Aloni examined 2103 rats, and at Telhara Hospital Assistant Ashraf Ali examined 28. In neither place did any rat show evidence of plague. The smallness of the work done at Telhara showed on inquiry that Telhara was practically rat free. The total expenditure in the Akola district at the three places named was Rs.2822. It may be concluded from this investigation that the four places in which the examination was carried on are not foci in which plague exists or persists in rats during the period of abatement of the disease in man. It may be mentioned that while investigations were being carried on by Captain Fowler plague broke out at a village named Ghusar, some six miles from Akola, and four rats which had died there were sent in and were examined by him. He found that all of them gave undoubted microscopic evidence of plague, which was confirmed microscopically by smears from the spleen and from the heart's blood, these showing large numbers of the characteristic bacilli. Plague had been present in this village from Feb. 22nd, 1907, until April 11th, 1907, with 99 attacks and 57 deaths, but not subsequently.

*Malaria at Bombay City.*

The corporation of Bombay has decided to carry out, in coöperation with the landowners concerned, a most useful improvement on Malabar Hill. For long the marshy ravine on the western slope of the hill has lain under the well-founded suspicion of being the prime cause of the malaria which obstinately clings to several houses in the vicinity of Nepean-road. The ravine is fed by leakage from the Malabar

Hill reservoir, and the water collecting in pools and swamps affords breeding-places for mosquitoes. Now the ravine is to be thoroughly drained by an open V-shaped drain, and the water is to be carried direct to the sea. This is an improvement out of all proportion to the cost; the wonder is that it was not carried out years before. It should go a long way towards rendering healthy a notoriously unhealthy locality. Whilst this matter is under consideration, it is suggested that inquiry be made into the hygienic condition of the foreshore between Sir Dinshah Petit's bungalow and Meher Hall. There is a quantity of undergrowth there which would be much better cut down, and there are more stagnant pools than are desirable in a residential locality.

*St. John Ambulance Association.*

Considerable activity is being shown in the United Provinces in the matter of St. John Ambulance Association work. The aim and object of the association are well known. A centre has been in existence in these Provinces for five years, and a special effort is now being made to add considerably to its efficiency. At the desire of His Honour the Lieutenant-Governor, who is the patron of the association, a strong committee has been formed, and classes and examinations are being arranged. This activity is not confined to Allahabad. It is hoped that in each district a centre will be formed for Europeans and Indians. Besides this there are, or will be, about 48 police classes working under the authority of the United Provinces Central Committee at Allahabad. The Hon. Sir John Stanley is President of the United Provinces centre and is taking an active part in the work. All information as to membership, classes, &c., may be obtained from Mr. W. P. S. Milsted, Honorary Secretary, St. John Ambulance Association, Allahabad. The following is the composition of the United Provinces centre:—Patron: H.H. the Lieutenant-Governor of the United Provinces. President: The Hon. Sir John Stanley, K.C. Vice-Presidents: Sir G. Knox and the Hon. A. R. McRoberts. Treasurer: Mr. G. J. M. Hamilton. Secretary: Mr. W. P. S. Milsted. Committee: The Commissioner of Allahabad, the Hon. Mr. Justice Karamat Husain, the Collector, the Civil Surgeon, Rev. W. S. Holland, Mr. F. Luker, Mr. H. R. Warner, Lady Knox, the medical officer of the Dufferin Hospital, Dr. S. C. Banerji, Dr. Ranjit Singh, the Assistant to the Civil Surgeon, Mr. A. C. Mumford, I.C.S., and Syed Muhammad Zamin.

*Prevention of Enteric Fever.*

With a view to protect young soldiers arriving in India from the many dangers to health (more especially enteric fever) to which they are susceptible whilst travelling to their destinations after disembarkation, the Government of India has sanctioned as a permanent measure the deputation of responsible non-commissioned officers, with some Indian experience, to meet and accompany to their destinations drafts of young soldiers arriving from the United Kingdom and elsewhere, unaccompanied by non-commissioned officers with previous Indian experience. The measure has proved successful during the past few trooping seasons during which it has been on trial.

Dec. 11th, 1909.

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THE death occurred on Monday night last, from acute tuberculosis, of Mr. Septimus J. Lee, L.R.C.P. Lond., M.R.C.S. Eng., of Brampton, Cumberland, in the Hospital for Epilepsy and Paralysis, Maida Vale, W., of which he had been resident medical officer since April, 1909. Educated at Edinburgh and Middlesex Hospital, the late Mr. Lee was appointed to the Hospital for Epilepsy and Paralysis as soon as he had qualified, and a promising career has been terminated by his untimely death whilst engaged in the hospital's service.

THE HEALTH OF GLOUCESTER.—The medical officer of health of Gloucester (Dr. J. R. Bibby) in his annual report for 1909 states that during the year the birth-rate was 22·53, the average rate for the previous ten years being 27·6. The death-rate was 13·9, compared with an average of 14·6 for the preceding ten years. The infantile death-rate was 96·3, as against an average of 121·6 for the previous ten years. Dr. Bibby considers that the reduced infantile death-rate is largely due to the increased efforts of the sanitary department and to the instructions given to mothers as to the feeding and clothing of children.

# Obituary.

## THOMAS DIXON SAVILL, M.D. LOND., M.R.C.P. LOND., D.P.H. CAMB.,

PHYSICIAN TO THE WEST END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM.

WE deeply regret to learn of the death of Dr. Thomas Dixon Savill, which occurred at Algiers on Monday, Jan. 10th, as the result of a fall from his horse and a fracture of the skull.

Thomas Dixon Savill, whose valuable scientific career has thus been cut off at the early age of 53, was the only son of Mr. T. C. Savill, whose family were for many years closely connected with the fortunes of THE LANCET, being the proprietors of the printing and publishing firm by which for some time THE LANCET was produced. He was educated at that admirable old school, the Stockwell Grammar School, and entered St. Thomas's Hospital with a natural science scholarship. He became also William Tite scholar at the school, and took many prizes in different subjects of the medical curriculum. In 1881 he graduated in honours in medicine in the University of London, taking the M.D. degree in the following year, and later the Membership of the Royal College of Physicians of London. Having studied also at St. Mary's Hospital, at the Salpêtrière in Paris, in Hamburg, and in Vienna, he was recognised at the outset of his career as a thoroughly well-equipped young physician, and one who might be depended upon to go far. He was quickly appointed registrar, pathologist, and assistant physician to the West London Hospital, and showed his disposition towards the study of neurology by translating Professor Charcot's lectures on Diseases of the Nervous System, these being the demonstrations many of which he himself had heard. In 1885 he was appointed medical superintendent of the Paddington Infirmary when it first opened, and the results of his work at this infirmary were to give him a very intimate knowledge of the working of the Poor-law hospitals, while as president of the Superintendents' Society he became an authority on many of the questions so freely ventilated, though not always answered, in the recent Majority and Minority Reports of the Poor-law Commission. In communications both to our columns and elsewhere Savill always took up a very judicious attitude on the relations between the public and the medical profession in these matters, while he was particularly anxious to bring before his colleagues the now generally accepted view that clinical investigation has in the Poor-law infirmaries of the country a rich but nearly unworked field. It was largely due to his experience at the Paddington Infirmary that he was able later on to write a complete "System of Clinical Medicine" from almost a personal point of view, an achievement which marked him, even among those who disagreed with some of his theories and deductions, as a man of great originality and knowledge.

In 1892 he decided to give up an institutional career and to become a consultant physician that he might give full play to a personal bias towards neurological work, but some early papers in THE LANCET on dermatological subjects, together with the fact that he held an appointment at the St. John's Hospital for Diseases of the Skin, led to his being best known at the beginning of his career as an authority on cutaneous disease. A series of clinical lectures on neurasthenia appeared as a book in 1899, and in the course of 10 years went through four editions. This book showed Savill to be an original thinker and to have a gift for clear exposition of his views. He broke away from the tendency to separate off special symptomatic varieties of the disease, such as cardiac, gastric, or pulmonary, and devoted his main thesis to the discussion of its essential nature, suggesting an etiological classification which is in some ways more satisfactory than any that has yet been advanced. In fact, the treatise substantially increased our knowledge of a difficult and important subject, and gained due recognition amongst neurologists outside our own country. More recently, having been appointed physician to the West-End Hospital for Diseases of the Nervous System, he turned his attention to the special study of the other great functional neuroses, and his Lectures on

Hysteria and the Allied Vaso-motor Conditions were so recently published in book form and reviewed in our columns[1] that we need not refer further to them. Suffice it to say that we took the view that although Dr. Savill had adduced a wealth of clinical material to support his contention of the essentially vascular origin of hysterical manifestations, yet his theory was too "cut-and-dried" to explain adequately the multifarious phenomena of that disorder. There was, however, much worthy of study in the book, and the chapter on treatment showed a resourceful mind full of excellent suggestions.

Dr. Savill was examiner in medicine at the University of Glasgow and at the Society of Apothecaries in London, and was one of the medical officers to the Royal Commission on Vaccination from 1891 to 1894. In 1902 he issued the "System of Clinical Medicine," to which we have already referred. It is undoubtedly his most important contribution to medicine, and its success has been proved by the recent issue of a new edition. We gave it a warm welcome because it really did provide a text-book of medicine based on the lines of the clinical teacher. Briefly, the arrangement of the book is symptomatological. It discusses seriatim each of the chief systems of the body, and under each section the prominent symptoms which point to disease in any particular system are described in groups, all the possible causes of these symptoms and their differential diagnosis being next given. This is, after all, the way that a case has to be approached in actual practice. The last part of the section deals with the separate diseases, giving a brief description of each, chiefly from the clinical standpoint. The result has been to provide a book of great value to those who are already grounded in their medicine, although it would be undoubtedly an advantage for a student to know the rudiments of the individual diseases before reading it. Equipped with that knowledge, he must find the book an excellent means of coördinating his ideas, helping to remind him that the "separate entity" conception of diseases is often misleading. A section over which Dr. Savill took special pains was that dealing with arterial diseases, as he had worked for many years on the subject, and when he was still at Paddington had described the condition of the media to which he gave the name of arterial hypermyotrophy. We believe that this book, if it is kept adequately revised, will take its place amongst the standard text-books of English medicine. Dr. F. S. Langmead, it should be said, was associated with the author in the preparation of the recent edition.

It will be seen from this brief sketch of Dr. Savill's career that he was an exceptionally endowed man, a specialist in more than one direction, but with the broadest possible foundation of general medicine whereon to rely for his rules of classification and his appreciation of the comparative importance of symptoms. He was a man of great literary ability, and in addition to the work more specially alluded to he was for many years a regular correspondent of THE LANCET, summarising for us the scientific debates at the more important medical societies as well as contributing a great number of articles, chiefly on diseases of the nervous system, diseases of the skin, and diseases of the arteries. Among these contributions may be mentioned A Further Contribution on an Epidemic Skin Disease, THE LANCET, Sept. 29th, 1894; Therapeutics of Saline Laxative Mineral Waters, THE LANCET, Nov. 23rd, 1895; On the Use of Alcoholic Beverages in Rheumatic and Gouty Conditions, THE LANCET, August 14th, 1897; The Pathology of Itching, THE LANCET, August 1st, 1896; Acroparæsthesia and other Vasomotor Disorders, THE LANCET, June 1st, 1901; The Pathology of Hysteria, THE LANCET, July 20th, 1901; The Treatment of Hysteria, THE LANCET, June 22nd, 1907; Senile Epilepsy, THE LANCET, July 17th, 1909; and Psychology and Psychogenesis of Hysteria, Feb. 13th, 1909. This list of contributions shows Savill's industry, as well as the particular range of his interests, but the general knowledge displayed in the "System of Clinical Medicine" lay behind all these special contributions.

In 1901 Dr. Savill married Dr. Agnes Forbes Blackadder, who is at present assistant physician to the St. John's Hospital for Diseases of the Skin, and who was closely associated with his labours. To this lady Dr. Savill has acknowledged his great indebtedness in the production of his text-book of medicine. We offer her our very sincere sympathy on the tragic loss which she has sustained.

At a meeting of the medical staff of St. John's Hospital for Diseases of the Skin, held in the board room at the out-patient department, Leicester-square, Dr. Morgan Dockrell, in moving the adjournment of the meeting, referred in sympathetic terms to the sad death of their late colleague, Dr. Thomas D. Savill, who had been attached to the hospital for the past 15 years. He had done good and valuable work and was very thorough in all that he undertook. He excelled as a clinician and a teacher, and he devoted himself with untiring zeal to the needs of the patients under his care. Dr. M. K. Hargreaves seconded the motion, and the meeting was adjourned to a future date. A vote of condolence was also passed and great sympathy expressed for Dr. Agnes Savill, who is a member of the staff, in the sudden bereavement which has befallen her.

[1] THE LANCET, 1909, vol. ii., p. 999.

## JOHN HOLMES JOY, M.A., M.D. DUB.

A PROMINENT practitioner of the Midlands has died at Tamworth, Staffordshire, in the person of Dr. John Holmes Joy, who passed away on Jan. 4th at his residence in that town. He was born in Dublin in 1842 and was the youngest son of the late Henry Holmes Joy, Q.C., LL.D., of Dublin and Belfast, a famous Irish lawyer, grandson of the late Serjeant Ludlow, recorder of Bristol, and grand-nephew of Chief Baron Joy of the Court of Exchequer in Ireland. He was educated at Trinity College, Dublin, and graduated M.A., M.D., M.Ch. in 1865, and also took the diploma L.M. Rotunda Hospital, Dublin. Soon afterwards he went to Chili as ship's surgeon, and taking medical diplomas in Spanish he acquired a large practice in Valparaiso, where in 1868 he married Anita, daughter of Dr. John McKay and Mrs. McKay of that town, and formerly of Fortwilliam, Inverness-shire. He returned to England in 1873 and bought the late Dr. J. F. Woody's practice at Tamworth.

In practice he was very successful both in a private and public capacity, and it was not long before he became a leading member of the community, as was evidenced by his appointment in 1883 to the commission of the peace for the counties of Stafford and Warwick. He seems to have had an hereditary or intuitive knowledge of law which made his work on the bench very valuable. He held a number of medical appointments in his neighbourhood, being certifying factory surgeon for the Tamworth district and medical officer to the Post Office, an appointment which he only resigned some three years ago. He was district surgeon to the London and North-Western Railway Company, medical referee under the Workmen's Compensation Act, on the honorary staff of the Tamworth Hospital, and medical attendant to the Guy's almshouses. As a member of the board of guardians and health authority he strove hard for the improvement of the sanitation of his district. Professional recognition also came to him from his brethren, for in 1892 he was made president of the Birmingham and Midland Counties Branch of the British Medical Association and was also president of the Midland Medical Society.

In 1898 he was appointed coroner for East Staffordshire. No better man could have been chosen for his office which he filled to general satisfaction until his last illness. Dr. Joy was a Past Master of the Marmion Lodge of Freemasons at Tamworth and a member of the Alma Mater Lodge at Birmingham. He leaves three sons and a daughter. His body was buried on Jan. 8th in the presence of a large gathering.

## GEORGE MORTON WILSON, M.B., C.M. EDIN.

BY the death of Dr. George Morton Wilson on Jan. 6th the medical profession loses a prominent pioneer of the open-air treatment of tuberculosis. His sanatorium, opened about ten years ago, was one of the first three sanatoriums for Nordrach treatment in England.

Dr. Wilson graduated at Edinburgh in 1890, and after a voyage as ship's surgeon in the Orient Line and two hospital appointments, he started practice in the north-west of London. In 1898 signs of pulmonary tuberculosis manifested themselves, and, after undergoing a course of treatment at Nordrach, he gave up general practice, and in 1900 he opened at Penmaenmawr the sanatorium known as

"Nordrach-in-Wales." For some time his health appeared to be completely established; but a few years ago there were signs of recrudescence of the disease, and he began gradually to fail. During the last year he worked under great difficulties with indomitable courage and fortitude. To within a few weeks of his death he supervised all the details of sanatorium treatment in his usual thorough and conscientious manner. Gifted with a charming personality, and endowed with patience, firmness, sympathy, and tact, he made an ideal sanatorium physician, and his whole-hearted devotion to his work gained not only the confidence but also the affection of his patients, who will mourn him now both as doctor and friend. Dr. Wilson was married and leaves a son and daughter.

### CHARLES JOSEPH WHITE, M.D. St. AND.

WE regret to record that Dr. Charles Joseph White died at Parkstone, Dorset, on Dec. 23rd of last year, in his eighty-fifth year. His early days were spent at Southsea. He received his medical education at University College, London, and took his degree at St. Andrews. He was for some time in the service of the P. and O. Co., thereby gaining wide experience as a traveller, afterwards settling in a private practice at Snodland, near Rochester, where his poorer patients were the especial objects of his untiring care and attention. In 1887 his health broke down through overwork and he retired to Parkstone, where the latter years of his life have been devoted to literary pursuits, botany being one of his favourite studies.

# Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the first professional examination held on Jan. 4th, 5th, 6th, and 7th the following candidates were approved in the undermentioned subjects:—

*Chemistry and Physics.*—John Gordon Ackland, Royal Albert Memorial College, Exeter; Wilfred Herbert Alderton and Christian Philip Sidney Allingham, London Hospital; Antoun Bishara, Cairo and St. Thomas's Hospital; Wilfred Angel Easton and Cassidy de Wet Gibb, Guy's Hospital; Olaf Gleeson, Westminster and King's College Hospitals; Vernon Edmund Lloyd, Guy's Hospital; John Neal, St. Bartholomew's Hospital; Sydney Jessie Scott Reid, Royal Free Hospital; Simon Simons, University College, Cardiff; John Rollo Noel Warburton, St. Thomas's Hospital; and Gerald Charles Wright, London Hospital.

*Chemistry.*—Hallowes Lloyd Addison, King's College; Otto Baier and Herbert Chorley, Liverpool University; Charles Theodore James Drobig, St. Mary's Hospital; Cuthbert Lindsay Emmerson, St. Bartholomew's Hospital; Thomas Sacheverell Greenaway and Alfred Morgan Hughes, Westminster Hospital and King's College; Joseph Kinnear, Manchester University and St. Thomas's Hospital; Hugh Ley Puxon Peregrine, St. George's Hospital and King's College; Garnet Wolseley Pool, St. Thomas's Hospital; Charles Rees Smith, Guy's Hospital and Birkbeck College; Walter Bernard Risk Stower, St. Bartholomew's Hospital; and William Henry Arthur Douglas Sutton, Guy's Hospital.

*Physics.*—Arthur Causton Freeth, St. Mary's Hospital; Harold Percy Gabb, University College; William Henry Harris, St. Bartholomew's Hospital; Claude Osborne Hudson, Sheffield University; and Ramon Ramero Sy Quia, City of London College.

*Biology.*—Christian Philip Sidney Allingham, London Hospital; Cedric Whitfield Armstrong, London Hospital; Fritz Ernest Bendix, Birkbeck College; Richard Oakes Crawshay, King's College; Thomas Hungerford Cresswell, Middlesex Hospital; Arthur Causton Freeth, St. Mary's Hospital; Lacy Norman Glaisby, Leeds University; Olaf Gleeson, Westminster Hospital and King's College; Owen Hairsine, Middlesex Hospital; Donald Herbert Hargrave, London Hospital; William Reginald Huleatt Heddy, Middlesex Hospital; Abdel Halim Hilmy, Cairo and St. Thomas's Hospital; Leon Kahan, London Hospital; Charles George Gordon Keane, St. Mary's Hospital; Tom Ramsden Kenworthy, Leeds University; Sydney Hudson Keys, Middlesex Hospital; Labib Abd-el Malik, St. Mary's Hospital; Walter Edgar Masters, London Hospital; Hoel Parry Price, Guy's Hospital; Sydney Jessie Scott Reid, Royal Free Hospital; John Patrick Shaw, Middlesex Hospital; Eric Morse Townsend, St. Paul's School and Birkbeck College; Thomas Reginald Trounce, Guy's Hospital; John Rollo Noel Warburton, St. Thomas's Hospital; and Ernest Jenner Wright, St. Mary's Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the Preliminary Science Examination for the Licence in Dental Surgery held on Jan. 4th, 6th, and 7th the following were approved in the subjects specified below:—

*Chemistry and Physics.*—Montague Kempston Butler, Birkbeck College; Henry James Cavanagh, Polytechnic Institute; Trafford Dudley Corke and Cyril James Crocker, Battersea Polytechnic; Eldred Leslie Fraser, Guy's Hospital; John Harvey Havers Griffin, South-Western Polytechnic; William Arthur Sowden Hills, East London Technical College and City of London School; Samuel George Howle, Municipal Technical School, Birmingham; Philip Hutson, Polytechnic Institute; Edward Eastaugh Johnson, Technical Institute, Norwich; Francis Vincent Maguire, Technical Institute, West Ham; Archibald Daniel Marston, St. Thomas's Hospital; Wilfred Richard Matthews, Polytechnic Institute; Charles Douglas Neale, Guy's Hospital; Arthur Leslie Packham, Middlesex Hospital; Lily Fanny Pain and Arthur Norman Paul, Birkbeck College; Charles Joseph Phillips, Guy's Hospital; Clifford Thomas Plimsoll, Royal Albert Memorial College, Exeter; Frederick John Smith, Sheffield University; Norman David Swayne Straton, Hartley College, Southampton; George Lotan Venning, Municipal Technical School, Plymouth; Herman Wolff, Charing Cross Hospital; and Francis Bernard Yonge, Dulwich College.

*Chemistry.*—Sidney William Bevis, Guy's Hospital; Patrick Boyle, Polytechnic Institute; Ronald William Carmichael, Polytechnic Institute; Frank Lewis Fletcher, City of London College; Arnold Gibson, Royal Technical Institute, Salford; Robert William Spong, Municipal College, Portsmouth; Edgar Roskelly Williams, Guy's Hospital; and Reginald Wallace White, Polytechnic Institute.

*Physics.*—Vincent Clifford Carrington, University College, Nottingham; Thomas Clement Davies, Wandsworth Technical Institute; Charles Wyndham Martin, Liverpool University; Arthur Pomroy Sainsbury, Polytechnic Institute; Edward Royston Saul, Guy's Hospital; Harold John Stickland, Birkbeck College; and William Henry Whitworth, Manchester Municipal Technical Institute.

SOCIETY OF APOTHECARIES OF LONDON.—At the Primary Examination (Parts I. and II.) held recently the following candidates passed in the subjects indicated:—

*Biology.*—C. A. Hepburn, Manchester.

*Chemistry.*—H. P. Jelley, Edinburgh.

*Materia Medica and Pharmacy.*—K. L. Hart-Davis, Royal Free Hospital; H. P. Jelley, Edinburgh; and A. J. V. Mathews, St. Mary's Hospital.

*Anatomy.*—D. T. Corke, London Hospital; and H. P. Jelley, Edinburgh.

*Physiology.*—D. T. Corke, London Hospital; R. Fowle, Edinburgh; and H. P. Jelley, Edinburgh.

UNIVERSITY OF EDINBURGH.—The following candidates were admitted to the degree of M.B., B.S., on Dec. 17th, 1909:—

D. C. Adam, J. R. Adam, David Aiken, R. J. Allsopp, M. S. J. Begg, Eveline R. Benjamin, C. A. Bignold, Walter Bisset, Peter de Bruijn, Peter Chalmers, P. H. Chauvin, James Davie, I. D. Dickson, Fred. Dillon, J. W. C. Drever, J. C. Drysdale, William Dunlop, Thomas Fraser, E. L. Galletly, T. J. Gilmore, W. T. Graham, Colin Grant, R. W. Greatorex, T. E. Guthrie, Robt. Hamilton, R. W. Hauman, J. B. Haycraft, John Henderson, A. E. Huckett, J. H. Jones, R. R. Kerr, C. G. Kurien, I. H. Lipetz, H. A. V. Loote, W. H. Lowe, A. J. M'Connell, James Mackail, D. Mackinnon, A. H. G. Mackintosh, S. E. Malherbe, A. M. Minford, R. M. Nicholson, W. J. Nisbet, Hugh Paterson, H. R. A. Philp, J. A. Pienaar, J. P. du Plessis, Ella F. Pringle, Agatha M. Robinson, C. S. Sandeman, Jessie A. Scott, J. M. Scott, J. D. Skinner, M. B. Smith, Wm. Stevenson, and E. V. Williams.

FOREIGN UNIVERSITY INTELLIGENCE.—*Prague (German University):* Dr. E. Munzer and Dr. G. Pick have been promoted to Extraordinary Professorships of Medicine. *Prague (Bohemian University):* Dr. L. Syllaba and Dr. A. Vesely have been promoted to Extraordinary Professorships of Medicine, and Dr. A. Heverock to an Extraordinary Professorship of Psychiatry.—*Strasburg:* The Chair of Ophthalmology with the Directorate of the University Ophthalmic Clinic has been offered to Professor E. Hertel, First Assistant in the Jena Ophthalmic Clinic.—*Tours:* Dr. Barnsby has been appointed to the Chair of Clinical Surgery in succession to Dr. Delagénière; Dr. Baudouin has been appointed to the Chair of Anatomy in succession to Dr. Ledouble; Dr. Bondouy of Rennes has been appointed to the Chair of Pharmacy and Materia Medica.—*Tübingen:* Dr. Albrecht has been recognised as *privat-docent* of Laryngology, Rhinology, and Otology.

THE DAIRIES OF WILTSHIRE.—At a recent meeting of the Calne board of guardians the chairman referred to the annual report of the county medical officer of health, and stated that the inspection of dairies showed there were a considerable number of cow-yards that were dirty and that greater cleanliness was necessary amongst the milkers.

THE Winter Dinner of the West African Medical Staff will take place at the New Gaiety Restaurant on Wednesday, Jan. 26th. Members of the staff who have not yet received notice and who desire to be present are requested to communicate with Dr. W. T. Prout, C.M.G., 78, Rodney-street, Liverpool.

THE NATIONAL ANTI-VIVISECTION HOSPITAL.—We have received two communications from the secretary to the board of management of this hospital reporting the result of meetings of the board of management. The purport of one is to declare that if the authorities of the hospital

had had more opportunity to explain their position the recent condemnatory verdicts of coroners' juries would not have been given. At the second meeting a house physician and a house surgeon were appointed.

ROYAL MICROSCOPICAL SOCIETY.—The next meeting of this society will be held on Wednesday, Jan. 19th, at 8 P.M., when the annual address will be delivered by the President, Sir E. Ray Lankester.

THE GRESHAM LECTURES, 1910.—Dr. F. M. Sandwith, Gresham professor of physic, will deliver four lectures on Small-pox and Vaccination at 6 P.M. on Jan. 18th, 19th, 20th, and 21st. These lectures are free to the public.

THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, PLYMOUTH.—The total sum received by the treasurer from the Hospital Sunday collections amounted to £865. The Sunday schools collections in aid of the children's ward during 1909 realised £58.

A MEDICAL CENTENARIAN.—Mr. Edgar Jones, J.P., of Billericay, Essex, who celebrated the 100th anniversary of his birthday on Jan. 5th, is the second son of the late Mr. N. W. Jones of Clifton, Bristol. He has two sisters, aged 94 and 93 years respectively. Mr. Jones retired from the medical profession several years ago and has lived throughout his retirement at Billericay.

ROYAL WEST OF ENGLAND SANATORIUM, WESTON-SUPER-MARE.—At a special meeting of the committee of management of the Royal West of England Sanatorium held in October, 1909, it was decided to admit no more patients suffering from pulmonary tuberculosis. It was also determined to close the institution during November and December and to thoroughly disinfect and clean the building. This has been carried out at a cost of £400, and on Jan. 3rd the sanatorium was reopened for the admission of patients.

# Appointments.

*Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to* THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ATKINS, G. E., M.R.C.S., L.R.C.P. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Wombwell District of the county of York.

BANKS, ISAAC, M.D., B.Ch. R.U.I., has been appointed a District Medical Officer by the Merthyr Tydvil (Glamorganshire) Board of Guardians.

ISAAC, RICHARD JAMES, L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed District Medical Officer by the Swansea Board of Guardians.

KING, WILLIAM ATHOL DESMOND, L.R.C.P. Lond., M.R.C.S., has been appointed Deputy Medical Officer for the Paignton and Marldon District of the Totnes (Devon) Union.

MILES, ALEXANDER, M.D., F.R.C.S. Edin., has been appointed Surgeon to the Royal Infirmary, Edinburgh.

MORISON, RUTHERFORD, M.B. Edin., F.R.C.S. Edin. and Eng., has been appointed Professor of Surgery in the University of Durham College of Medicine, Newcastle upon-Tyne.

MORTON, A. STANFORD, M.B., C.M. Edin., F.R.C.S. Eng., has been appointed Consulting Ophthalmic Surgeon to the Central London Throat and Ear Hospital.

STEVENS, BERTRAM CROSSFIELD, M.D., M.S. Durh., D.P.H., has been appointed an Assistant Medical Officer of Health and an Inspector of School Children to the Ayr County Council.

WATSON, C. GORDON, F.R.C.S. Eng., has been appointed Assistant Surgeon to St. Bartholomew's Hospital.

# Vacancies.

*For further information regarding each vacancy reference should be made to the advertisement (see Index).*

ABERDEEN ROYAL INFIRMARY.—Assistant Surgeon.

ASHTON-UNDER-LYNE, DISTRICT INFIRMARY AND CHILDREN'S HOSPITAL.—Senior House Surgeon. Salary £120 per annum and fees, with board, residence, and laundry.

BRISTOL ROYAL INFIRMARY.—Honorary Assistant Dental Surgeon.

BURNLEY, VICTORIA HOSPITAL.—Resident Medical Officer. Salary £100 per annum, with residence, board, and washing.

CANCER HOSPITAL, Fulham-road, London, S.W.—Surgical Registrar. Salary 50 guineas per annum.

CARDIFF INFIRMARY (GENERAL HOSPITAL).—House Surgeon for six months. Salary £30, with board, residence, and laundry.

CARDIFF MENTAL HOSPITAL, Whitchurch.—Physiological Chemist. Salary £200 per annum.

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Clinical Assistant.

CHELTENHAM GENERAL HOSPITAL.—House Physician and House Surgeon, unmarried. Salary £70 per annum each, with board and lodging.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Senior House Surgeon. Salary £120 per annum, with board, apartments, and laundress.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Pathologist. Salary 100 guineas per annum.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Resident Medical Officer, unmarried. Salary £100 per annum, with apartments, board, &c.

HANTS COUNTY ASYLUM.—Third Assistant Medical Officer, unmarried. Salary £160 per annum, with apartments, board, washing, and attendance.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.—House Physician, unmarried, for six months. Salary £30, with board and residence.

IRELAND, NATIONAL UNIVERSITY OF.—Extern Examiners in Chemistry, Anatomy, Physiology, Materia Medica, Medicine, Medical Jurisprudence and Hygiene, Pathology, Surgery, Ophthalmic Surgery, and Midwifery.

JOHANNESBURG HOSPITAL.—Medical Man in charge of the X Ray and Electrical Department. Salary at rate of £500 per annum.

LEEDS, HOSPITAL FOR WOMEN AND CHILDREN.—House Surgeon for six months. Salary is at rate of £50 per annum, with board, residence, &c.

LIVERPOOL HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.—Honorary Assistant Physician.

LONDON THROAT HOSPITAL, 204, Great Portland-street, W.—House Surgeon. Salary £50 per annum.

METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL, Grafton-street, Fitzroy-square, W.—Assistant Surgeon.

MILLER GENERAL HOSPITAL FOR SOUTH-EAST LONDON, Greenwich-road, S.E.—Honorary District Medical Officer.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Clinical Assistants for the Out-patient Department (females).

NORTHAMPTON, COUNTY BOROUGH OF.—Assistant Medical Officer of Health. Salary £200 per annum.

OLDHAM INFIRMARY.—Second House Surgeon. Salary £100 per annum, with residence, board, and laundry.

OXFORD, RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—House Surgeon, also Junior House Surgeon, both for six months. Salaries at rate of £80 per annum, with board, &c.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar, E.—Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board and residence.

PRESTON ROYAL INFIRMARY.—Junior House Surgeon. Salary £60 per annum, with board, washing, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Member of the Court of Examiners.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.—Honorary Physician to Out-patients.

ST. MARY'S HOSPITAL, London, W.—Resident Casualty House Surgeon. Salary £100 per annum, with board and residence.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Junior House Surgeon for six months. Salary £80 per annum, with board, residence, and laundry.

STIRLINGSHIRE SECONDARY EDUCATION COMMITTEE.—Two Medical Inspectors of School Children (one female). Salaries £300 per annum, with expenses.

WEST END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, PARALYSIS, AND EPILEPSY, 73, Welbeck-street, W.—Honorary Assistant Surgeon. Also Honorary Gynæcologist.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Honorary Clinical Assistant in the Dental Department.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Charing, in the county of Kent; at Settle, in the county of York; and at West Huddersfield, in the county of York.

# Births, Marriages, and Deaths.

## BIRTHS.

GEDGE.—On Jan. 1st, at Pewsey, Wiltshire, the wife of Arthur S. Gedge, M.R.C.S., L.R.C.P., of a daughter.

WILSON.—On Jan. 7th, to Dr. and Mrs. David Wilson, jun., Paddock, Huddersfield, a daughter.

## MARRIAGES.

SYMES-THOMPSON—TACON.—On Jan. 6th, at St. George's, Hanover-square, Henry Edmund Symes-Thompson, M.A., M.D., M.R.C.P., to Caroline Ada Chute Tacon, daughter of the Rev. Richard J. Tacon, of Rollesby Rectory, Norfolk.

## DEATHS.

JOY.—On Jan. 4th, at The Manor House, Tamworth, John Holmes Joy, M.A., M.D., J.P., H.M. Coroner for East Staffs, in his 63th year.

SAVILL.—On Jan. 10th, as a result of a fall from his horse in Algiers, Thomas Dixon Savill, M.D. Lond., M.R.C.P. Lond., D.P.H., aged 53 years.

*N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Short Comments, and Answers to Correspondents.

## "EXTRAORDINARY CIRCUMSTANCE."

THREE weeks ago, under the heading of "Looking Back," we published an extract from the columns of THE LANCET for Dec. 24th, 1831, in which Mr. John Hoare, M.R.C.S., related how a farmer of Somersetshire, whose wife had given birth to three daughters, uttered a vow that if she presented him with a daughter at her next confinement he would never speak to her. A son was born, who, though he could converse perfectly well with his mother and sisters, was unable to speak to his father (and other males) for the remaining 30 years of that rash man's life. A most interesting comment appeared on this story in the form of a letter sent by a Bristol correspondent to, and published in, the *Daily News*, which ran:—

> In the "Old World Gleanings" of the *Bristol Times and Mirror* for Jan. 30, 1886, the substance of the letter from John Hoare quoted by you is given under the heading of "Strange Circumstance," and in addition is the following: In confirmation of the above curious circumstance, the following authenticated statement, made some years since, is worthy of being recorded, and it is given in the words of the late venerable clergyman, the Rev. John Boun, of Bath:—
>
> "On the 20th April, 1825, I called with my young friend, Mr. John Beauchamp, of West Pennard, at the hamlet of Lubbon, in the parish of Baltonsborough, to see an extraordinary young man, Eli Higgins, who, though 28 years of age, had never spoken to his father; but who could converse with his mother and sisters when in private with them. I saw him, when I asked him some questions, which he answered in writing. I told him that if he should happen to come to Bath I should be glad to see him at my house. On the 23rd of May he called, and, to my surprise, he entered freely into conversation with me, and told me that he had never the power to speak to his father, or to any other person in the neighbourhood, but only to his mother and sisters, nor even to them if any person was present. I asked him for a reason of his silence; he could not account for it in any way otherwise than that he wanted power to speak; but he had heard that his father had made a rash vow, but could not say what that vow was. He also desired that I would not make the circumstance known to his neighbours of his having conversed with me, lest they should suppose that his silence proceeded from obstinacy, not inability; but whilst his father lived he never should be able to speak to him, or anyone else in the country but his mother and sisters, but supposed that, should his father die, he might be restored to the free use of his tongue. Eli Higgins is a respectable-looking young man, the son of Robert and Jane Higgins. His father occupies his own freehold estate at Baltonsborough."

We are obliged to our contemporary for opening its columns to so singular a corroboration of our former correspondent's veracity, but we feel constrained to maintain the cautious attitude of the then editor of THE LANCET and to be content with retelling the story of this curious case of intermittent aphonia without comment.

## THE ANTI-TUBERCULOSIS EXHIBITION.

THIS peripatetic exhibition, which we described at its successful inauguration by the National Association for the Prevention of Consumption and Other Forms of Tuberculosis at Whitechapel last June, was lately held in Oxford, Paddington, and Chelsea, and during the first week of this year was moved to Marylebone. On some previous occasions it had been found that the principal visitors to this educational display belonged to the well-dressed members of the community, and, as phthisis in Marylebone makes its chief ravages among the very poor, it was decided by the organisers that the exhibition must be housed in the least aristocratic locality, and in a building which no one would be too timid to enter. The County Council school in Bell-street, Lisson Grove, admirably answered these requirements and was thronged with eager visitors, especially in the evenings. During the six and a half days that the exhibition was open 10,583 admissions were recorded, about half of whom were school children, and nearly all of whom belonged to the poorest classes of the neighbourhood. Many intelligent working men found time to be there, besides crowds of mothers who attended with their babies. The school teachers were interested in the question from the start and announced to the children that on the reopening of the school an essay would have to be written on the exhibition. This doubtless stimulated some of the youngsters to pay a second visit and to pass on to their friends the information gained the day before from an untiring group of willing helpers. The pathological specimens were referred to as "'earts and souls in bottles," but, on the whole, the feeling of the crowds was one of intelligent interest and subdued awe. One delicate-looking boy remarked proudly to a lady helper, "Oh, yes, there is lots of consumption in our family; the doctor says I'm tubercular, but *Mother* says I ain't." One of the last visitors to the exhibition fired a Parthian shaft at the ladies which they found difficult to parry. In the evenings these helpers were very tired and probably looked it, so a muscular charwoman, after being worsted in an argument on the value of fresh air, revenged herself by exclaiming, "Well, miss, I don't think much of the looks of you ladies, for all your fresh air." The talks to school children were a great success, and they seemed thoroughly impressed with the dangers of "dust, darkness, damp, and dirt," while several were overheard officiously telling their elders to open their windows, or to sweep a room without raising dust. Experience here, as elsewhere, showed that the rising generation is very appreciative of new truths. Popular lectures, illustrated by lantern slides, were given every evening by Dr. J. E. Squire, Dr. J. J. Perkins, Dr. J. Walter Carr, Mr. C. H. Garland, Dr. W. P. Herringham, Dr. Jane Walker, and Dr. Christine Murrell, and were increasingly well attended, so that the last two lectures had to be given twice, on each occasion to crowded rooms. The greatest praise is due to the ladies of the Marylebone Health Society who so successfully carried through the undertaking and loyally aided Miss M. E. Broadbent, who bears a name reminiscent of energy and public spirit.

## DANGEROUS HAIR-DYES.

*To the Editor of* THE LANCET.

SIR,—Although not desiring to appear an advocate for the employment of hair-dyes, there may be justification for their use under special circumstances; therefore it can do no harm to give your readers information concerning a harmless and efficient hair-dye which imparts a rich black colour to the hair.

I discovered its application by chance and analogy very many years ago, and my recollections of it were refreshed by an excellent paper which was read a few years ago by Dr. Joseph O'Carroll of Dublin at the Royal Academy of Medicine, Ireland, on "Lead Encephalopathy," in which he traced the symptoms to the use of a hair-dye containing lead.

In the preparation that I referred to bismuth is the metallic ingredient and it is prepared as follows: I took 1 drachm of bismuth nitrate Bi $(NO_3)_3$ in crystals (free from uncombined nitric acid) and dissolved it in an ounce of glycerine, and made up to 10 ounces with distilled water; this was used by my "subject" with ammonium sulphydrate solution, and after with sodium sulph-hydrate as being less offensive than the former. Some time after I was working at original investigation on Emerson Reynolds's sulphurea, when it occurred to me to use it as a source of the electro-negative radicle of the bismuth compound; this succeeded, and as sulphurea solution has no unpleasant smell its use was an advantage.

Perhaps this information may be acceptable to some of your readers. If you think so, you are very welcome to make use of it.

I am, Sir, yours faithfully,

NINIAN M. FALKINER.

Terenure, Ireland, Jan. 1st, 1909.

*** The reaction between bismuth nitrate and thio-urea results probably in the formation of sulphide of bismuth and the regeneration of urea. At all events, alkaline silver nitrate gives urea and silver sulphide, although the oxides of lead and mercury give sulphides and cyanamide.—ED. L.

## THE HEALTH OF MAURITIUS.

THE report of Sir Graham Bower, K.C.M.G., Colonial Secretary of Mauritius, who recently arrived in England on leave, on the Blue-book of the Colony for the year 1908 has just been presented to both Houses of Parliament. There was a decrease in both the general population and the Indian population during 1908. In the general population the deaths exceeded the births by 325, and amongst the Indian population the deaths exceeded the births by 1315. The birth-rate in the general population was 34·1, and in the Indian 36·3 per 1000. The death-rate rose from 34·7 in 1907 to 40·0 in 1908. There has been a steady increase in poverty for years past, and it was greatly aggravated in 1908 by the financial crisis through which the island has passed. The proportion of general population relieved in 1908 was 35·2 per 1000, as against 26·2 in 1907; and the proportion of Indian population relieved was 8·9, as against 6·2. With so much poverty and unemployment the island must be over-populated. The admissions into the hospitals and asylums of the colony rose from 20,371 in 1906 and 23,335 in 1907 to 27,751 in 1908. The number of cases treated in dispensaries increased from 55,635 in 1907 to 66,077 in 1908. The admissions to hospital for malaria numbered 5071, the highest figure recorded during the past ten years, with the exception of 1905, when the number reached 5123. A large number of cases of splenic enlargement due, apparently, entirely to old-standing malarial infection came into hospital largely owing to distress. There was an alarming increase in deaths from diarrhœa and dysentery, 310 and 1316 respectively in 1908, as against 230 and 899 in 1907. The actual type of the disease has not yet been definitely established, but there are indications that many of the cases are of amœbic origin. Although in isolated outbreaks infection may possibly have taken

place through the instrumentality of flies or dust, there seems to be good ground for regarding the contamination of rivers and streams, which serve very generally as sources of water-supply, with excremental matters as the principal channel of infection. 229 cases of enteric fever were notified, as against 145 in the previous year, this rise, however, being accounted for probably by the greater accuracy of diagnosis, principally through the assistance furnished by the bacteriological laboratory. It is not infrequent to meet with cases of more or less continued fever refractory to quinine with no malarial parasites in the blood, in which Widal's reaction is negative. These cases, which appear to be neither malarial nor typhoid in their nature, seem to point to the existence in the island of a febrile affection or affections, possibly similar to the unclassified fevers of India. The cases of diphtheria notified rose to 114, against 60 in 1907, and there were 14 deaths. Anti-diphtheritic serum from the Lister Institute was supplied by Government to all who applied for it. The epidemic of measles which broke out in 1907 continued in 1908, but disappeared before the end of the year; 476 cases were registered with 27 deaths. The number of cases of plague recorded during the year was 167, showing a reduction of 57 upon that for the preceding year. The epidemic of plague of 1908 was the smallest since 1899. The campaign against it was conducted on the same general lines as before, special prominence being given to the destruction of rats and disinfection of contaminated and insanitary premises. 172,504 rats were destroyed; of these, 11,518 were microscopically examined and 234 were found plague-infected. In spite of this a fairly severe epidemic is at present affecting the island. Twenty cases of cerebro-spinal meningitis were recorded during the year, this being the first time that this disease has ever assumed anything like epidemic form in the colony; 16 out of the 20 cases ended in death. Beri-beri showed no tendency to recur in epidemic form. In addition to the cases admitted to the public hospitals, a few scattered cases were reported by private medical practitioners. Nephritis, whatever may be its etiology, is steadily on the increase. It is to be hoped that clinicians and bacteriologists will unite in their endeavours to trace its as yet obscure causes. Erysipelas assumed some epidemic prevalence during the year, 73 cases being notified, with 16 deaths. Little change has taken place in the number of lepers maintained at the St. Lazare Asylum at the expense of Government, but this is no criterion of the progress of the disease in the island, as segregation in the asylum is not compulsory. The report describes at some length the anti-malarial measures which are being carried out in accordance with the recommendations of Professor Ronald Ross.

### CONSCIENTIOUS.

"Is your milkman reliable?" asks the careful man in the *Fliegende Blätter*, and receives as a reply, "Absolutely! He even sterilises the water he adds to the milk."

### THE "RYLAND SCHEMATIC EYE."

THE Ryland Schematic eye has been placed on the market to meet the demand for a practice eye which reproduces the conditions of the human eye. It is provided with four standard refractive conditions—viz., (1) hypermetropia; (2) myopia; (3) astigmatism; and (4) emmetropia. Conditions 1, 2, and 4 are obtained by differences in the length of the globe, while 3 is obtained by the use of a toric cornea. The globes are solid glass and of a refractive index to bring the nodal and principal points to practically the same position as in the human eye. The length and radii are the same as those met with in the average eye. In addition the backs are left slightly grey, thus giving a realistic appearance to the artificial retina, and also permitting the study of the retinal images and their variation for different positions of the correcting lens. It is completed by the addition of an iris diaphragm in contact with the cornea to give variation of pupillary aperture. The whole is nicely mounted and packed in a morocco case and may be obtained from any optician.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

## METEOROLOGICAL READINGS.

*(Taken daily at 8.30 a.m. by Steward's Instruments.)*

THE LANCET Office, Jan. 12th, 1909.

| Date. | Barometer reduced to Sea Level and 32° F. | Direction of Wind. | Rainfall. | Solar Radio in Vacuo. | Maximum Temp. Shade. | Min. Temp. | Wet Bulb. | Dry Bulb. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| Jan. 6 | 30·52 | S.E. | ... | 43 | 43 | 38 | 39 | 40 | Overcast |
| ,, 7 | 30·57 | S.W. | ... | 44 | 44 | 39 | 40 | 40 | Overcast |
| ,, 8 | 30·23 | S.W. | ... | 51 | 44 | 40 | 43 | 44 | Overcast |
| ,, 9 | 30·05 | S.W. | 0·02 | 56 | 53 | 44 | 48 | 50 | Cloudy |
| ,, 10 | 30·03 | S.W. | 0·08 | 77 | 53 | 48 | 47 | 49 | Cloudy |
| ,, 11 | 29·85 | W. | 0·01 | 70 | 46 | 44 | 42 | 44 | Fine |
| ,, 12 | 29·56 | W. | 0·09 | 59 | 41 | 35 | 35 | 36 | Overcast |

# Medical Diary for the ensuing Week.

## SOCIETIES.

**ROYAL SOCIETY OF MEDICINE, 20, Hanover-square, W.**

TUESDAY.

PATHOLOGICAL SECTION (Hon. Secretaries—L. S. Dudgeon, C. Bolton): at 8 P.M.

*Communications:*

Mr. Walter Edmunds: Action of Thyroid and Anti-thyroid Preparations.

Dr. P. J. Cammidge and Dr. Semon: An Experimental Investigation of the Origin and Cause of the "Pancreatic" (Cammidge) Reaction in the Urine.

Mr. S. G. Shattock: Oöphorectomy and the Growth of the Pelvis in the Cow.

Dr. Herbert French: (1) A Case of Extensive but not Complete Destruction of the Adrenal Capsules by Caseation without Symptoms of Addison's Disease; (2) Pigmentary Deposits in Liver and Pancreas in Bronzed Diabetes.

Mr. E. O. Thurston: Chylous Cyst from the Neck.

THURSDAY.

DERMATOLOGICAL SECTION (Hon. Secretaries—E. G. Graham Little, H. G. Adamson): at 5 P.M.

*Cases:*

Dr. J. H. Sequeira: Case of Tuberculides.

Dr. H. G. Adamson: Onychia Syphilitica Sicca.

Dr. E. G. Graham Little: Sclerodermia.

And other cases.

ELECTRO-THERAPEUTICAL SECTION (Hon. Secretaries—Reginald Morton, G. Harrison Orton): at 8.30 P.M.

Dr. J. A. Voorthuis (Holland) will demonstrate and read a paper on the Use of the Static Brush and Flame Discharge in the Treatment of Some Skin Diseases.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

**MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.**

MONDAY.—4 P.M., Dr. W. Evans: Clinique (Skin). 5.15 P.M., Lecture:—Dr. E. Wynter: Heart Disease in Middle Life.

TUESDAY.—4 P.M., Dr. P. Stewart: Clinique (Medical). 5.15 P.M., Lecture:—Dr. J. Collier: Acute Encephalitis and Acute Poliomyelitis in the Year 1909.

WEDNESDAY.—4 P.M., Mr. J. Cantlie: Clinique (Surgical). 5.15 P.M., Lecture—Dr. A. Lieven (Aix-la-Chapelle): On the Treatment of Syphilis.

THURSDAY.—4 P.M., Sir Jonathan Hutchinson: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. A. Wylie: Fœtid Breath.

FRIDAY.—4 P.M., Mr. W. Stuart-Low: Clinique (Ear, Nose, and Throat).

**POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.**

MONDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eyes. 2.30 P.M., Operations. 5 P.M., Lecture:—Mr. Armour: Anatomy of Hernia.

TUESDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. 12.15 P.M., Lecture:—Dr. Pritchard: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Dr. Saunders: Clinical (with cases).

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Diseases of the Throat, Nose, and Ear. 12.15 P.M., Lecture:—Dr. G. Stewart: Practical Medicine. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. B. Harman: Diseases of the Eyes. 2.30 P.M., Operations. Dr. Robinson: Diseases of Women. 5 P.M., Lecture:—Mr. Bidwell: Surgical Treatment of Duodenal Ulcer.

THURSDAY.—10 A.M., Lecture:—Surgical Registrar: Demonstration of Cases in Wards. 12 noon, Pathological Demonstration:—Dr. Bernstein. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Dunn: Diseases of the Eyes. 2.30 P.M., Operations. 5 P.M., Mr. R. Lloyd: Anæsthetics.

FRIDAY.—10 A.M., Dr. Moullin: Gynæcological Operations. Medical Registrar: Demonstration of Cases in the Wards. 2 P.M., Medical and Surgical Clinics. X Rays. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Operations. Dr. Abraham: Diseases of the Skin. 5 P.M., Lecture:—Dr. Abraham: Cases of Skin Disease.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Mr. B. Harman: Diseases of the Eyes. Dr. Davis: Diseases of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. 2.30 P.M., Operations.

**NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.**

MONDAY.—Clinics:—10 A.M., Surgical Out-patient (Mr. H. Evans), 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Nose, Throat, and Ear (Mr. H. W. Carson). 4.30 P.M., Medical In-patient (Dr. A. J. Whiting).

TUESDAY.—Clinic: 10 A.M., Medical Out-patient (Dr. A. G Auld). 2.30 P.M., Operations. Clinics:—Surgical (Mr. W. Edmunds); Gynæcological (Dr. A. E. Giles). 4.30 P.M., Lecture-Demonstration:—Mr. F H. Wallace: Difficulties in Anæsthesia.

WEDNESDAY.—Clinics:—2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. R. P. Brooks). 3 P.M., X Rays (Dr. H. Pirie).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson). 3 P.M., Medical In-patient (Dr. G. P. Chappel). 4.30 P.M., Lecture:—Dr. T. R. Whipham: Idiocy and Allied Disorders in Children. (First Lecture.)

FRIDAY.—10 A.M., Clinic:—Surgical Out-patient (Mr. H. Evans). 2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Eye (Mr. R. P. Brooks). 3 P.M., Medical In-patient (Dr. R. M. Leslie).

**LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.**

MONDAY.—2 P.M., Operations. 2.15 P.M., Mr. Turner: Surgery. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4 P.M., Mr. R. Lake: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir Dyce Duckworth: Neuritis.

TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. Carless: Surgery. 4 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Sir W. Bennett: Surgery. 4 P.M., Dr. Sale-Barker: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir William Bennett: Some Points relating to Movable Kidney.

FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

**WEST-END HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, 73, Welbeck-street, W**

MONDAY.—3 P.M., Clinical Demonstration: Dr. H. Campbell.
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WEDNESDAY.—3 P.M., Clinical Demonstration:—Dr. F. Palmer.
FRIDAY.—2 P.M., Clinical Demonstration:—Dr. P. Stewart. 5.30 P.M. Clinical Demonstration: Dr. E. Macnamara.

**CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn road, W.C.**

THURSDAY.—4.30 P.M., Clinical Lecture:—Mr. C. Nourse: Antral Suppuration.

**ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C.**

THURSDAY.—6 P.M., Chesterfield Lecture:—The Treatment of Eczema in all its Forms.

## OPERATIONS.

### METROPOLITAN HOSPITALS.

**MONDAY (17th).**—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.).

**TUESDAY (18th).**—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College 2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

**WEDNESDAY (19th).**—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan 9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

**THURSDAY (20th).**—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, (9 A.M., Major, 2 P.M.).

**FRIDAY (21st).**—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.) Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor 9 A.M., Major, 2 P.M.).

**SATURDAY (22nd).**—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

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